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AUTHOR Swail, Watson Scott
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ABSTRACT

Although a number of studies have focused on the identification of factors impacting upon minority student persistence at four-year colleges and universities, few have studied the specific factors that affect minority persistence in science, engineering, and mathematics departments at predominantly minority-serving institutions. The main objectives of this study were to: identify causal factors regarding minority-student attrition, identify successful retention practices and programs, and develop a retention framework for administrators and practitioners to utilize during the planning and implementation stages of program development. It utilized a modified Delphi process to validate a conceptual framework for student retention that was developed from an extensive review of related literature. A panel of 16 experts from across the country rated and commented on specific objectives within the framework during the 2-round Delphi technique. The result of this was a student retention framework incorporating five components: financial aid, recruitment and admissions, academic services, curriculum and instruction, and student services. A collection of approximately 80 specific objectives were identified during this process and are categorized within the 5 components. Contains 156 references. (JRH/Author)

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THE DEVELOPMENT OF A CONCEPTUAL FRAMEWORK TO INCREASE STUDENT RETENTION IN SCIENCE, ENGINEERING, AND MATHEMATICS PROGRAMS AT MINORITY INSTITUTIONS OF HIGHER EDUCATION

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By

Watson Scott Swail

B.Ed. May 1985, University of Manitoba

M. Sc. August 1991, Old Dominion University

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Dennis Holmes, Ph.D.
Professor of Education

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ABSTRACT OF DISSERTATION

Although a number of studies have focused on the identification of factors impacting upon minority student persistence at four-year colleges and universities, few have studied the specific factors that affect minority persistence in science, engineering, and mathematics (SEM) departments at predominantly minority-serving institutions. Furthermore, the available research does not attempt to bridge these causal factors and prescriptive actions together to form a cohesive and comprehensive student retention system.

The main objectives of this study were to: (a) identify causal factors regarding minority-student attrition, (b) identify successful retention practices and programs, and (c) develop a retention framework for administrators and practitioners to utilize during the planning and implementation stages of program development.

This study utilized a modified Delphi process to validate a conceptual framework for student retention that was developed from an extensive review of related literature. A panel of 16 experts from across the country rated and commented on specific objectives within the framework during the two-round Delphi technique. This validation process allowed panelists to review commentary from other panelists between each of the two Delphi rounds.

The result of the Delphi research was a student retention framework incorporating five components: Financial Aid, Recruitment and Admissions, Academic Services, Curriculum and Instruction, and Student Services. A collection of approximately 80 specific objectives were identified during this process and are categorized within the five components. The framework is organized much like a menu of proven interventions and programs to assist administrators and practitioners at college campuses with the planning, implementation, and monitoring of a comprehensive student retention program.

It is hoped that further research using this framework as a foundation will result in an instrument that is reflective of the needs of four-year institutions, yet is flexible enough to conform to conditions that are relative to individual campuses.

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CHAPTER ONE

INTRODUCTION

The issue of minority entrance into mathematics, science, and technology disciplines is attracting considerable attention at the national level. It is of such high-level interest that Goal Five of the GOALS 2000 Act, which proposes that American students will be first in the world in mathematics and science achievement, states that "the number of United States undergraduate and graduate students, especially women and minorities, who complete degrees in mathematics, science, and engineering will increase significantly" (GOALS 2000, 1994).

While recent studies have shown that minority students are achieving significantly higher ACT and SAT scores and are attending college at higher rates than previously identified (Rodriguez and Nettles, 1993), a study conducted by the National Science Foundation (1994) found that during the fifteen-year period from 1977 to 1991, the number of African American students receiving bachelors degrees in science, engineering, and mathematics (SEM) fields declined 5.1 percent, Native Americans made only marginal gains of 11.0 percent, and only the Latino population made steady gains of over 48 percent. Although the study also reported that each of the minority groups noted made more significant gains in the attainment of doctoral degrees, it can safely be inferred that the support of this trend will be stagnated without the increased enrollment of minority students into SEM undergraduate programs. Thus, the achievement of Goal Five of the National Education Goals, although five years away from its target point, is already in jeopardy.

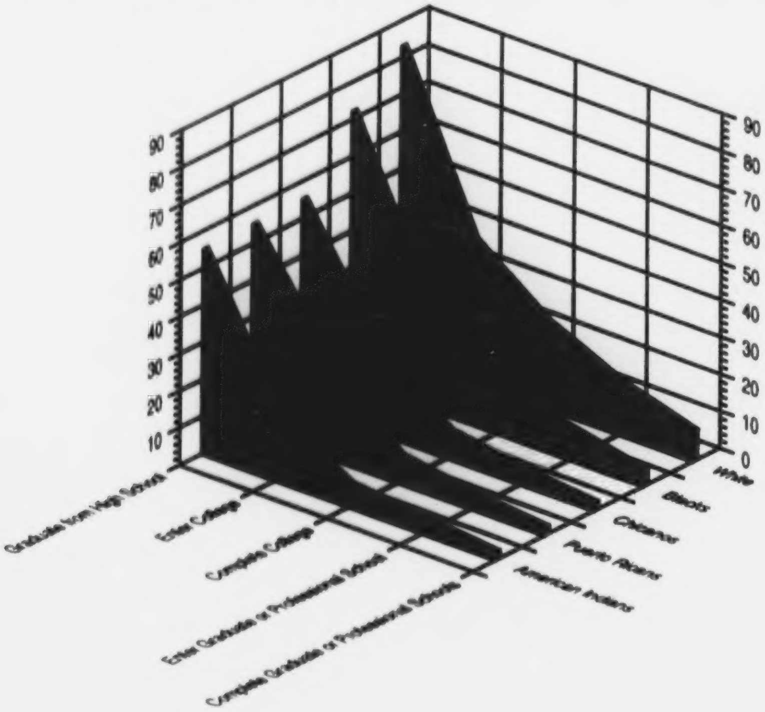
The purpose of this study is to respond to Goal Five of the National Education Goals by developing a conceptual framework which minority institutions can utilize in the formulation of a campus-wide retention program focusing on the sciences. As will be discussed in the background section of this chapter, retention is a critical issue in the fight to increase the representation of underrepresented minorities enrolling and persisting in the sciences.

Background

What is now known as the "pipeline issue" has become the focus of considerable attention in the past decade. The pipeline refers to the pool of persons who are eligible to enter a particular field or occupation. Mathematically speaking, the pipeline acts like a vortex, in which the entrance to the pipeline encompasses a large majority of the population during their youth. As time goes on, however, various factors, including socioeconomics, motivation, and aptitude, pull people out of a particular pipeline, effectively reducing the flow of persons toward the intended field or occupation. Figure 1 illustrates how quickly the pipeline is reduced.

In terms of science, engineering, and mathematics, the pipeline of minorities is considerably smaller than that for white males by the time of high school graduation. The reduction of the SEM pipeline is affected by a number of factors, and the scientific/mathematical talent pool, as Berryman (1983) refers to it, diminishes at successive points before, during, and after secondary school. An abundance of research has shown that minority children and females are negatively influenced by the sciences early in life through societal stereotypes (Berryman, 1983; Clewell, Anderson, and Thorpe, 1992; Fennema and Sherman, 1976; Malcom, 1988; Matyas and Kahle, 1986; National Science Foundation, 1988; Silverman and Pritchard, 1993). These researchers and others contend that a lifetime of social growth represents the act of conditioning one's expectations and place within society. As Clewell et al. (1992) state, the interest of minorities and females in the sciences is essentially squelched by the time they reach the seventh grade. By the time minority students reach high school, many minority students are generally unsupported, unprepared, or simply unmotivated to take the types of SEM courses needed to proceed to a four-year institution. For many students who manage to complete the appropriate courses for matriculation into higher education, other factors during secondary schooling, including poor teaching, inadequate laboratory facilities, and lack of real-world application, make the transition to higher education most difficult (AAMC, 1992; Carmichael and Sevenair, 1991; Fullilove and Treisman, 1990).

Figure 1. Educational Pipeline from High School Through Graduate Degree



Source: Swail (1995). Data extracted from the Final Report of the Commission on the Higher Education of Minorities, Higher Education Research Institute, Inc., Los Angeles, CA (1977).

The report of the Retention Task Force for the Commission on the Higher Education of Minorities (Landis, 1977) released data illustrating the pipeline problems of all students in higher education (See Figure 1). The illustration shows the tremendous drop of students in the pipeline from high school through to graduate study. Although the figures for white students are higher, the graphic illustration shows the similarity in the shape of the curve among each of the groups shown, suggesting that the pipeline problem is equally felt by all race/ethnic groups. While the most impressive decrease illustrated in the graph occurs between high school and college matriculation, the decrease that is most relevant occurs between freshman matriculation and graduation. While the SEM pipeline is expected to decline between high school and college, the pipeline exodus occurring during the college years is more surprising. At best, 61 percent of students were retained by the universities during the Commission study. However, these rates represent the retention figures for white students. Minority students did not fair nearly as well in the Commission study, as represented by the 41 percent retention rate for African Americans, 32 percent for Chicanos, 28 percent for Puerto Ricans, and 35 percent for Native Americans. As these figures suggest, at least two-thirds of minority students leave college before graduation, causing a massive reduction in the educational pipeline for minorities.

Although the number of minority students entering college has almost doubled since 1976 (NCES, 1994, p. 207), problems associated with high attrition rates continue to plague the SEM pipeline. Although we have identified the significant attrition problems facing minority students in U.S. colleges and universities, the issue of student retention plagues all student groups, regardless of race. Thus, the identification of retention variables, development of intervention programs, and the creation of institutional policy to reduce student attrition is an important area of study for all institutions of higher education.

Over the past twenty-five years, the issue of student retention in higher education has received much attention in the educational policy arena, mostly due to the realization that the rate of student departure from higher education is disturbingly high (Astin, 1982; Tinto, 1993). Benchmark studies by Tinto (1975), Astin (1975), Pantages and Creedon (1978), Cope and Hannah (1975), Beal and Noel (1980), and others are largely responsible for the elevation of student retention on the college agenda. In fact, while those authors suggested that the literature regarding student retention in higher education was immense at the time of their studies, the twenty years that have since passed has created an even greater dearth of research in that area of study.

During this period, considerable discussion has centered around the identification of retention factors for minority students in U.S. colleges and universities. Studies conducted by Astin (1982), Blackwell (1992), Whimbey, Carmichael, Jones, Hunter, and Vincent (1980), and Fullilove (1990) have resulted in the proposal of theories regarding minority retention in higher education. Research has also shown that the factors affecting minority students vary from that of white students, and has concentrated on such issues as minority achievement and retention on predominantly white campuses (Burrell and Trombley, 1983; Gibbs, 1975; Loo and Rolison, 1986; Suen, 1983), achievement and retention on minority campuses (Lang and Ford, 1988; Gates, 1989), and issues emphasizing the retention of SEM students, both on minority and predominantly-white campuses (Bagayoko and Kelley, 1994; Carmichael and Sevenair, 1991; Culotta, 1992).

During this time frame, there have been essentially three foci of the research conducted regarding student retention. The first regards the size and breadth of the retention problem. Three studies in particular have illuminated the retention rates of colleges and universities. The American College Testing Program (ACT) and the National Center for Higher Education Management Systems (NCHEMS), in a joint three-year study, found that only 53 percent of students graduated within five years of their entrance into college (Beal and Noel, 1980). Findings of a second prominent study, the National Longitudinal Survey of the High School Class of 1972, illustrated that 60 percent of all first-time students left before graduating (Eckland and Henderson, 1981). A third study conducted by the National Institute of Independent Colleges and Universities (Lenning, Beal, and Sauer, 1980) found that only 41 percent of all students graduated with a bachelors degree by the sixth year. With the exception of Asian

Americans, the retention rates of other minority groups, specifically Hispanics and African American students, were considerably lower than that of white students (20.4 and 23.9 percent respectively). These retention figures have been substantiated by more recent studies, including those conducted by the U.S. Student Association (1992) and the American Association of State Colleges and Universities (1994). Thus, while researchers are still exploring the size and breadth of the retention problem within and across institutions, the presence of a significant retention problem has been substantiated.

The second focus of retention research during this period has been on the determination of factors and variables correlated with retention in higher education. Lenning (1982), in his synthesis of the studies of Cope and Hannah (1975), Lenning, Beal, and Sauer (1980), Lenning, Sauer, and Beal (1980), Pantages and Creedon (1978), and Ramist (1981), managed to categorize the retention factors presented by these researchers. The six categories developed by Lenning include student academic ability, demographics, aspirations and motivations, personality and values, institutional variables, and student/institution interaction. Additional studies by Cross and Astin (1981), Astin (1982:1993), Landis (1985), and Lang (1986) have built upon the previous retention studies by using the models developed by Tinto (1975) and others, but with a minority perspective. Factors identified through the literature include the causal effects of campus climate (Loo and Rolison, 1986; Suen, 1983), socio-economic backgrounds (QEM, 1990), and the presence of role models and mentorships (Ugbah and Williams, 1989; Pinkston-McKee, 1990) on minority student retention.

The third focus of the research has been on the development of retention models and programs. Since the introduction of pioneering retention models by Tinto (1975), Bean (1982), and Noel (1978), numerous retention programs have been developed and implemented in colleges and universities across the United States. Exemplary student retention programs include the Delaware State College Project Freshman Attrition Reduction (FAR) Program (Gates, 1989), the University of California at Berkeley

Mathematics Workshop Program (Fullilove & Treisman, 1990), and the Baylor College of Medicine Science Enrichment Program (Pinkston-McKee, 1990). These programs, in addition to others, incorporate such retention interventions as tutoring, skill development, counseling, mentoring, and research programs.

Most of the programs reviewed in the literature, such as those identified above, operate at the departmental level (e.g., Chemistry, Physics, English) and are focused on the freshman student population. In addition, retention programs are most often independent of each other and are not linked with other retention efforts on campus. However, it is important to acknowledge that an extensive body of literature suggests that institution-wide retention efforts are the most effective retention strategies to pursue (Pascarella, 1986; Noel, Levitz, and Saluri, 1985). Researchers, including Noel et al., have suggested that the most successful retention programs have been institution-wide programs, rather than departmentally located or individual interventions.

> First, a retention effort should be viewed as a kind of gigantic, campus-wide problem-solving exercise. It then naturally follows that there are certain steps that are logically and inevitably taken. Second, the essential task is to find a way to mobilize the collective wisdom that already exists on campus. The best solutions to the problems on a campus—and solutions do exist—for the most part reside with its own people (Noel, Levitz, and Saluri, 1985, p. 454).

Other researchers concur with this statement, including Smith and Sprandel (1985):

> In our experience over the past few years, we have now come to recognize clearly that retention cannot be improved without involving the total campus system. This means involving everyone in a planned change

> effort that will improve the quality of campus life by drawing upon our institutional ability to function as a strong community (p. 369).

Pascarella (1986) suggests that institutions need to "organize salient constituencies" (p. 101) on campus to orchestrate reform that evokes a positive change in student persistence. These comments from highly regarded retention experts strongly suggest that institutions must not only develop the capacity to assess their current status, but also develop specific strategies to embed the retention program within institution operation. Although the studies by Noel et al. (1985) and Smith and Sprandel (1985) have discussed how institutional change can support retention reform on campus, there has been very little focus upon the institutional issues regarding retention programming.

Statement of the Problem

In accordance with the Goals 2000 : Educate America Act, the expansion of the minority SEM pipeline will require a significant effort in the development of institutional policy and programming to support increased student retention. To achieve this goal, administrators at minority institutions of higher education must address the issue of retention in a meaningful and successful way. Although individual intervention programs have shown success in a variety of settings, the observation of Noel, Levitz, and Saluri (1985) regarding institutionalization bears an important consideration in the design of a successful retention effort: retention efforts are best made as an inclusive effort, both horizontally and vertically, across the entire institution.

Administrators are, however, hard-pressed to find literature regarding the planning, institutionalization, and implementation of a retention program. During the retention program planning process, administrators and their accompanying research departments are likely to come across an abundance of literature regarding retention programs, student prediction, and factors affecting student retention and attrition. The search for information regarding planning and implementation strategies will be less fruitful, thus leaving administrators and faculty without the advantage of well-established, institutional processes for retention program development.

Purpose and Need for the Study

The absence of supporting research regarding institutional policy and the development of a successful retention program expressly for the purpose of increasing the number of minority students graduating with SEM undergraduate degrees creates the foundation for this study. While previous research has focused on theoretical and practical considerations that are important in this process, few relate exclusively to the increased development of SEM degrees conferred at minority institutions of higher education.

The purpose of this study was to develop a conceptual framework that will aid the planning and development of an institution-wide student retention program. The model in question, while developing ideas that may benefit many different student groups and institutions, focuses specifically on science-based programs at minority institutions.

The framework is structured much like a user's guide so that institutions may use it for both reference and direction during the pre-planning, planning, implementation, and monitoring stages of the program development. Each of these stages provide specific areas to explore and administer toward the goal of increasing student retention. In particular:

Stage 1 - Pre-Planning

- Analysis of size and scope of retention issue on campus
- Identification of student needs on campus

- Assessment of current retention strategies on campus
- Identification of institutional resources
- Identification of successful retention strategies through literature

Stage 2 - Planning

- Development of organizational strategies
- Identification of key stakeholders on/off campus and their roles within the retention process
- Assessment of Pre-Planning data
- Development of retention program components and operation strategies
- Development of implementation plan

Stage 3 - Implementation

- Implement retention strategies according to plan

Stage 4 - Program Monitoring

- Data collection and analysis regarding the retention strategies
- Provide feedback to participants
- Conduct formative evaluations to offer continuous feedback on the implementation and progress of the retention effort

The identification of the components of each of these stages and how they may be utilized and implemented will be of prime usefulness to institutions of higher education. The stages developed in the conceptual framework form the working structure for the retention committee to develop its own comprehensive program.

In addition to the framework suggested above, the instrument also defines specific areas of intervention to increase student retention. Specific strategies for each area have been identified and outlined in the framework.

Research Questions

The main research question for this study is:

> **What are the program components and implementation strategies that form an institution-wide, student retention model for minority institutions interested in increasing the number of SEM graduates?**

In the pursuit to answer the above research question, the following sub-questions will also be addressed:

1. What are the significant factors related to student attrition and retention at minority institutions?

2. What types of programs that have been successful in increasing retention rates at four-year institutions, minority institutions, and in SEM areas?

3. What are the key elements to be considered in the development and implementation of an institution-wide retention program?

    3.1 What data does the institution need to collect and analyze to effectively develop its retention program?

    3.2 What organizational strategies best support the planning and implementation of a student retention program?

3.3 Where should the authority and operation of an institution-wide retention program be housed within the institution?

3.4 What are the roles of the faculty and staff in the development of an effective institution-wide student retention program?

3.5 How will the administration monitor and evaluate the effectiveness of an institution-wide retention program?

4. What policies are needed to support the development and implementation of an institution-wide student retention program?

4.1 What policies are needed to support curriculum revision?

4.2 What policies are needed to support the development of better teaching practices?

4.3 What policies are needed to support academic support programs?

4.4 What policies are needed to support social support programs?

4.5 What policies are needed to support the administrative and organizational changes involved in the institution-wide retention program?

Significance of the Study

This institution-wide retention model will provide administrators with a strategy and framework to build a student retention plan that incorporates the individual needs of their students and institution. As previously mentioned, the scarcity of specific literature regarding student retention policy development does not support the needs of program planners. This study will provide a well-defined framework answering many of the questions raised by administrators and program designers in their quest to develop an institution-wide retention program.

The result of this model will allow administrators and planners to devote more of their time to planning and management rather than to the uncovering of research to support their actions. This is a most important provision, as the literature is often equivocal. That is, it is difficult to assess the final meaning of the aggregate research available on retention due to the large number of variables and other factors involved in the individual studies. The product of this study will offer administrators a concise explanation of the key variables that relate most specifically to minority institutions and SEM faculties.

With respect to program development and operation, an important aspect of the model will be the identification of organizational strategies which best support the planning and implementation of the student retention program. Regardless of the knowledge acquired and assessed by the institution, the need to follow a practical course of planning and implementation is essential to the ultimate success of any endeavor. Thus, the identification of successful organizational and planning strategies is imperative to this study and to institutions interested in fostering systemic change. From an administrative perspective, this model will also suggest alternatives for the administration of an institution-wide retention program, giving administrators a better idea of where and how to house the operation of the program, and what major pieces of institutional policy will become important factors in the success of the program.

Finally, this model will be particularly significant in providing an understanding of the various roles that will be expected and required of administrators, faculty members, and staff members on campus if the program is to be successful.

Research Methodology

The study will incorporate a two-part process. The first part of the study consists of the development of a formative retention framework based upon the findings of an extensive literature review. The second part of the study will incorporate a modified Delphi process to further develop and validate the formative framework. Upon the completion of the second round of the Delphi, a final conceptual framework will be developed.

Delimitations

Although the basic attributes of the conceptual framework will contain many relevant features of most institutions of higher education, this study will be limited to SEM-based education at minority institutions of higher education. The selection of the Delphi panel will support this delimitation by including experts of minority student retention, higher educational administration, and SEM areas.

Assumptions

This study is based upon two basic assumptions affecting the validity of the research outcomes. First, the original design of the policy-based retention framework, developed by the researcher following a review of current literature, will be assumed to accurately reflect the scope and meaning of the relevant literature in the area of SEM minority retention. A second assumption is in regard to the Delphi panel. It will be assumed that the participants involved with the expert panel will provide feedback during the Delphi rounds that is honest, pertinent to the study, and based upon their knowledge of the subject area and not of conjecture.

Definition of Terms

For the purpose of this study, the following terms have been defined to add clarity to the contents of this document:

African American. A person having origins in any of the black racial groups in Africa. Normally excludes persons of Hispanic origin except for tabulations produced by the Bureau of the Census.

Asian/Pacific Islander. A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This includes, for example, China, India, Japan, Korean, the Philippine Islands, and Samoa.

Attrition. Term used to describe the process of student departure from college.

Campus Environment or Culture. The social conditions present on a particular campus that create an atmosphere that is reflected by the attitudes and actions of students, faculty, and administration.

Campus-wide. Involving all departments and administrative areas of the campus. Institution-wide may also be used interchangeably.

Dropout. A student who leaves the institution and does not return for additional study at the college or university level.

Frontloading. Term used to describe the process of distributing services such that more assistance is given during the formative stage of programming rather than a consistent distribution. Usually used in terms of financial aid, where students may be given more money in their freshman year as compared to subsequent years of their college experience.

Gatekeeper Courses. Sometimes called 'gatekeepers.' Refers to introductory-level courses within a particular discipline that are prerequisite offerings for future course work. The term 'gatekeeper' is synonymous with the practice of using these courses as 'sifters' of the student population. That is, to remove students who do not fair well in the traditional sense.

Hispanic. A person of Mexican, Puerto Rican Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

HBCU (Historically Black Colleges and Universities). Term used to describe the 105 institutions established prior to 1964 with the principal mission of educating black Americans.

Institution. Refers to a four-year college or university.

Latino. A person who is either a native of Latin America or is a direct descendent of a Latin American.

Matriculation. The process of admission into a college, university, or program.

Minority Institution. A college or university whose student population is predominantly non-white.

Minority. Students who are underrepresented as a proportion of their percentage of the overall U.S. population.

Native American. A person having origins in any of the original peoples of North America and maintaining cultural identification through tribal affiliation or community recognition.

Non-Cognitive Factors. Factors that affect the academic ability of students that are not directly related to academics, such as socio-economics.

Persistence. Refers to the ability of a student or group of students to remain in college as opposed to dropping out.

Persister. A student who continuously enrolls in a college or university during the period of study.

Pipeline. A term used to describe the track that people follow en route to a particular vocation (e.g., the pipeline of persons in graduate school extends back to all students in kindergarten and before).

Retention. Term used to describe the process of continued student attendance, finalized by graduation. Antithetical to dropout.

SEM. Acronym for the academic areas of science, engineering, and mathematics. However, in terms of this study, also represents the study of technology.

Socio-Economic. Referring to both social and economic factors. Usually in the context of a person's relative wealth to national averages.

Stopout. A student who discontinues studies for a period of time, only to re-enroll at a later date.

Transfer. Students who transfer from SEM to another discipline or from one institution to another.

White. A person having origins in any of the original peoples of Europe, North Africa, or the Middle East. Normally excludes persons of Hispanic origin except for tabulations produced by the Bureau of the Census.

Chapter [illegible] introduces the reader [illegible] study, statement [illegible] of the study [illegible] of the study [illegible] limitations [illegible] review, [illegible] the [illegible] used for the research project. Chapter IV, Findings, will describe the outcomes of the Delphi process and the development of the policy-based retention framework. Finally, Chapter V, [illegible] Recommendations, will provide a synopsis of the previous [illegible] remarks regarding the study [illegible] the study and for the [illegible]

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This cha [illegible] attrition and p [illegible] of the chapter will [illegible] tors re [illegible] introductory discuss [illegible] nts leave co [illegible] regarding the key [illegible] tudent departu [illegible] conducted. Part II [illegible] will then build upon the knowledge of factors related to attrition by disc [illegible] ntions, programs, and considerations to be made in developing [illegible] ion program. Part III will discuss the [illegible] strategies and [illegible] mpus change [illegible] intensive retention [illegible]

PART I FACT [illegible] TO RE [illegible]

This section of the li [illegible] focus on five specific areas related to student persistence in college [illegible] will look at the [illegible] have been attributed [illegible] studies sp [illegible] ences. The [illegible] studen [illegible] tions [illegible] e climate an [illegible] and how it affects learning and living on campus will be discu [illegible] followed by a discussion of the importance of student goals and institution [illegible] ment. T [illegible] discussion

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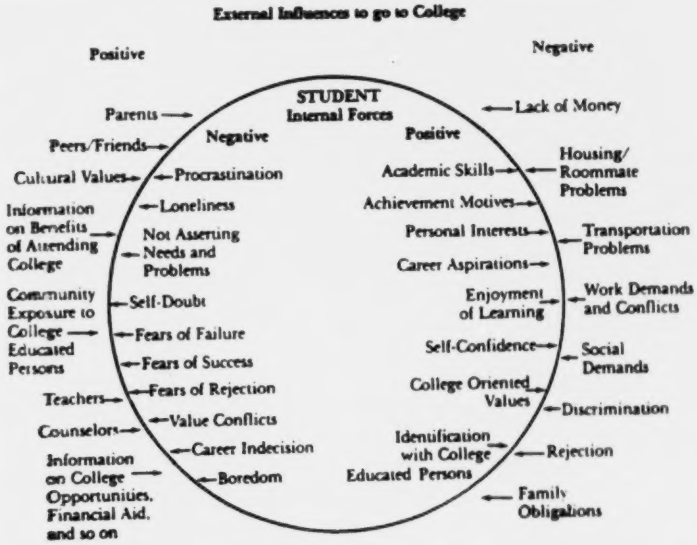
Why Students Leave College

The literature regarding minority student dropout from college abounds with details of why and when students leave college. Supplied in the following pages are four "lists" of factors that researchers have identified as related to attrition. Many of the items resurface throughout the literature and are common to a number of studies. In addition, many of the studies and literature reviews summarize similar sources and thus supply similar conclusions. Landmark studies by Tinto (1975), Pantages and Creedon (1978), Cope & Hannah (1975), Lenning, Beal, and Sauer (1980), and more recently, Cabrera, Nora, and Castaneda (1993), have shaped how most researchers and practitioners view the issue of student retention and departure. In particular, Tinto's attrition model has become a foundation for most research regarding student departure. As the reader will find, these names come up frequently in this review.

Figure 2. Anderson's Force Field Analysis of College Persistence.


External Influences to go to College
Positive
Negative
STUDENT
Internal Forces
Negative
Positive
Parents
Peers/Friends
Cultural Values
Information on Benefits of Attending College
Community Exposure to College Educated Persons
Teachers
Counselors
Information on College Opportunities, Financial Aid, and so on
Procrastination
Loneliness
Not Asserting Needs and Problems
Self-Doubt
Fears of Failure
Fears of Success
Fears of Rejection
Value Conflicts
Career Indecision
Boredom
Academic Skills
Achievement Motives
Personal Interests
Career Aspirations
Enjoyment of Learning
Self-Confidence
College Oriented Values
Identification with College Educated Persons
Lack of Money
Housing/ Roommate Problems
Transportation Problems
Work Demands and Conflicts
Social Demands
Discrimination
Rejection
Family Obligations

Source: Anderson, E. (1985). Forces Influencing Student Persistence and Achievement. In Noel, Levitze, Saluri and Associates (Eds.) Increasing Student Retention (pp. 44-61). San Francisco, CA: Jossey-Bass, Inc.

Although the previously mentioned studies as well as numerous others are worthy of mention in this review, a few studies in particular are included because of

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their unique relevance to this study. One such example is Anderson's (1985) "Force Field Analysis of College Persistence" (see Figure 2). This model is particularly interesting because it successfully and simply illustrates the various factors that researchers, including those just mentioned, have identified through research. The Anderson model integrates factors that are both external and internal to the student. Although many other studies (Lenning, 1982; Bean, 1985) are more comprehensive in identifying factors, they are not as efficiently represented as the Anderson model (see Appendix A for listing of Lenning's factors). The result is a simple model that is easily understood.

Neisler (1992) focused on issues relating to African-American students in her discussion of retention. The result was this 12-item list related to student departure:

1. Financial need and lack of financial aid
2. Lack of academic success
3. Personal, emotional, and family problems
4. Feelings of isolation, adjustment problems
5. Lack of commitment
6. Inadequate potential for success
7. Inadequate high school preparation
8. Inadequate language skills
9. Definition and attitudes about success
10. Responsibility for learning/motivation
11. Maturity
12. Lack of student services, counseling, tutoring, etc. (Neisler, 1991, p. 6)

The factors identified by Neisler are common to much of the literature regarding minority retention. A study conducted by Boone, Young and Associates (1984) for the Commission on Higher Education of minorities reported the following streamlined list of factors which they claim inhibit the success of minority students:

- unequal access to financial resources
- lack of success in obtaining faculty as mentors or advisors
- lack of role models
- inadequate support from administrators
- institutional insensitivity and indifference to minority student needs in general.

Although the factors identified above are more related to students at Predominantly White Institutions (PWIs), issues of finance, mentoring, role models, and administrative support cross the barriers between minority and majority institutions. The issue of institutional insensitivity may also remain a factor at minority institutions, not only in terms of level of administrative support, but also with regard to the "new" minority: white students on minority campuses.

Neisler (1992) also developed this list of factors pertaining directly to Historically Black Colleges and Universities.

1. Inadequate academic preparation
2. Financial aid and shortages of financial resources
3. Shortage of excellent faculty
4. Lack of choice and/or quality in curriculum
5. Problems with physical plant, buildings, etc. (p. 8)

The issue of finance is again identified as a key issue to retention. However, what differentiates this list from the others is the focus on issues relating to student learning. Neisler (1992) mentions the issue of student preparedness, shortage of excellent faculty, and quality of curricula as key variables in the choice and ability of students to persist in higher education.

One final list of factors (See Table 1) is extracted from a National Action Council for Minorities in Engineering document (Landis, 1985). This organization, established in the late 1970s, has been instrumental in the dramatic increases in the number of minority students who have earned engineering degrees during the past 20 years. In fact, between 1973 and 1992, the percent of minority students enrolled in freshman engineering has increased from a 4.4 percent share to 16.4 percent of all engineering degrees earned. In addition, the total number of minority engineering students during that period has almost doubled, from 51,207 to 92,699 (Morrison and Williams, 1993).

Table 1. Factors Relating to Minority Persistence in Engineering (NACME)

1. Motivation toward engineering
2. Math preparation prior to matriculation
3. Academic performance
4. Availability of adequate financial resources/aid
5. Self-confidence of students to do the work
6. Availability and quality of counseling
7. Availability and quality of tutoring
8. Personal/family problems
9. Admissions criteria
10. Existence of minority student organizations
11. Rigidity/flexibility of curriculum
12. Faculty attitude toward minority students
13. Availability of summer/permanent jobs in engineering
14. Social/economic background of students
15. Attitude of minority students toward majority faculty/students
16. Existence of minority faculty members
17. Change in career goals
18. School setting (rural vs. urban)
19. Attitude of majority students toward minority students

SOURCE: Landis, Raymond B. (1985). Handbook on Improving the Retention and Graduation of Minorities in Engineering. New York, NY: The National Action Council for Minorities in Engineering.

NACME's research identified factors related to student persistence in engineering fields. Table 1 is taken from a 1977 study conducted by NACME regarding minority persistence in engineering. What separates this list from the others identified in this review is the rank order attributed to each factor.

The literature presented in this section has illustrated many of the issues found to be significant contributors to student attrition at four-year colleges. The remainder of Part I will discuss the most significant of these concerns in detail.

Academic Preparedness

One of the major issues in higher education stems from the underpreparedness of entering students. It is estimated that between 30 and 40 percent of all entering freshman are unprepared for college reading and writing (Moore and Carpenter, 1985) and approximately 25 percent of all college students enroll in remedial math, writing, or reading courses (U.S. Department of Education, 1985). Without the prerequisite skills needed to survive the rigorous curricula of most college campuses, many students are represented as underachievers and leave college during their freshman year or before their sophomore year begins (Astin, 1975; Tinto, 1975; Richardson & Skinner, 1992).

The preparedness of students may also be illustrated through an assessment of recent statistics. In 1991, the average score of African Americans on the math component of the SAT was 104 points below that of white students (385 vs. 489), and Native Americans scored 5 points below whites (437 vs. 489). The average score for Hispanic students fell in the range between African American and Native American students (NSF Publication 92-303, 1992). In addition to this data, NAEP, ACT, and SAT scores combined illustrate an inequity in science knowledge among U.S. students: African-American and Hispanics students lagged between 18-30 percent behind white students (NSF Publication 93-22, 1992).

Part of this lack of preparedness for college and lack of interest in the sciences can be attributed to an earlier stage in the student's academic and social development. Clewell, Anderson, and Thorpe (1992) suggest that as early as age nine, minority students perform at lower levels in mathematics and science than do White students, primarily due to lack of confidence in their SEM ability, linguistic and cognitive factors, failure to take advanced-level SEM courses, and attitudinal factors, such as negative attitudes and stereotypes (e.g., parents) towards these subjects.

Several studies point to the academic deficiencies among many minority students, and in particular the inability of the school system to better serve underrepresented students (McDermott, Piternick, & Rosenquist, 1980; Fullilove & Treisman, 1990; Berryman, 1983; Astin, 1982; QEM, 1990). Astin (1982) has attributed much of the poor preparation of minority students to the poor quality of elementary and secondary education, while Berryman (1983) suggests that the public schools do not seem to serve any students particularly well in mathematics and science. The exposure to higher-order skill development is also a concern for these students, the result of which is that they have not "developed the reasoning skills that are necessary for acquiring science concepts, for organizing them into a conceptual framework, and for applying them in appropriate situations" (McDermott, Piternick, and Rosenquist, 1980, p. 136). An NAEP study of science skills of 17-year olds emphasized this lack of higher-order skills by finding that while 9 percent of white students had the ability to integrate specialized scientific information, only 0.5 percent of African-Americans and 1 percent of Hispanic students demonstrated this ability (American Association of Medical Colleges, 1992). Further exacerbating this issue is the perception that minority students cannot succeed in these higher-order disciplines. Bean (1985) found that teachers who thought this way were more likely to send negative messages to their students regarding their ability in math or science.

Aside from the development of higher-order thinking skills, many minority students are lacking other critical skills essential to their success in college (American Association of Medical Colleges, 1992; Epps, 1979; Halpern, 1992; Hanau, 1979; Humphreys, 1980; Ortiz, 1974). Reading, writing, test-taking, vocabulary, and study skills are often barriers to minority persistence in college. The underdevelopment of these skills severely hampers a student's ability to persevere through the onslaught of new information on a daily basis in college.

The course selection of high school students is a key variable in both the desire of a student to pursue study in the sciences and the preparedness of the student to persevere in post-secondary study. Studies by Fullilove & Treisman (1990) and Anderson (1989) found that African-American students were less likely than their white counterparts to take advanced courses, especially in physics and chemistry. Additionally, Anderson found that African-American students scored nearly 70 points below the national norm on achievement tests in physics, biology, and chemistry. Table 2 illustrates the gap between white students and African-American students with regard to enrollment in college-preparatory courses. In every category noted, African American students were less represented by percentage of their population in college-prep courses. The limited access of these "gatekeeper" courses to minority students severely hampers any possibility of their achieving in the sciences let alone persisting in or selecting these courses.

Table 2. Percentage of College-Bound Students Enrolled in Preparatory Math and Science Courses, 1990.

Course	White	African American
Algebra	97.0	95.0
Geometry	94.0	86.0
Trigonometry	56.0	43.0
Calculus	19.0	9.0
Biology	97.0	96.0
Physics	44.0	32.0
Honors Science	23.0	13.0

Source: National Science Foundation (Publication 92-303, 1992)

Campus Climate

The atmosphere or "climate" of a particular college is a factor that may either foster or inhibit the social and intellectual growth of a student, especially freshman students. Campus climate, with respect to minority students, has been the focus of numerous research studies (Loo & Rolison, 1986; Suen, 1983; Astin, 1975). Findings from these studies generally conclude that the culture shock of minority students attending PWIs can have a serious effect on their academic performance, social life, comfort level, and ultimately their persistence in college (Astin, 1982; Gibbs, 1975; Remsik, 1979). Historically Black colleges lend African-American students a more comfortable atmosphere in which to learn; an atmosphere that allows the African-American student an opportunity to mature, gain self-confidence, and evolve both educationally and socially (Whiting, 1988). Joyce Payne (1994), in her chapter in the ACE publication, Minorities in Higher Education, discusses the important role that HBCUs play for African American students:

> Historically, these colleges have institutionalized what John Dewey was talking about when he said that "education is the means of social continuity of life, . . . each individual gets an opportunity to escape from the limitations of the social group in which he was born, and to come into living contact with a broader environment" (Dewey, 1966). Giving rise to the correspondence between social responsibility and higher education, these institutions are places where social consciousness and equal opportunity are "built in" the fabric of academic and research programs; where great minds engage in democratic social relationships unalienated by ethnic and economic differences; where intellect, talent, and creativity elevate man beyond the social malaises of the world; and where strong

precedents exist for the advancement of progressive ideology and liberal thought. (Payne, 1994, p. 222).

In the case of HBCUs, enrollment figures are almost inversely proportionate to those of PWIs. In 1990, 82.6 percent of the students at HBCUs were African-American, while white students comprised 12.5 percent of the student population, and Hispanic, Asian-American, and Native American students represented 0.7, 0.7, and 0.1 percent respectively (NCES, 92-640, p.20). Although our previous discussion presents supporting evidence of the strong cultural support for the majority population, in this case, African American students, HBCUs must still be concerned with ensuring that a positive campus climate exists for all students, regardless of race or ethnicity.

At Mount St. Mary's College in Los Angeles, a small Catholic college of just over 1,000 students, the faculty, administration and staff of the university realized that campus climate was a major consideration in the development of an effective retention program. St. Mary's identified the following attributes important to support their multicultural population:

1. Campus climate of warmth, trust, and general caring
2. Active concern for student needs
3. Sense of community
4. Counseling services
5. Campus housing
6. Social life of the student body. (Sawchuk, 1991)

The focus of all institutional action and service at St. Mary's is oriented toward the support and nurturing of the student, and that the campus culture is not as much an issue of race or ethnicity, but rather, an issue of learning environment. St. Mary's College has firmly adopted the ideal that a multicultural environment is a strong positive force in the social and academic development of the student, and several other researchers have come to similar conclusions. Astin's (1993) recent study of minority colleges found that a campus with a strong emphasis on diversity had positive effects on the student body, including their satisfaction with the college experience, student life, facilities, and quality of instruction. Learning opportunities in diversity and multiculturalism create a heightened cultural awareness, satisfaction, and reduced materialism while also increasing student commitment to promoting diversity issues on campus. Justiz (1994) suggests that a campus climate which embraces "multicultural experiences, encourages diversity, and promulgates pluralism," is also a campus which can evolve and change along with the changes in people and society (p. 13). In addition, Justiz also states that these institutions are more likely to support the development of a positive learning environment by emphasizing high standards of teaching and learning, encouraging faculty to become role models and mentors to students, and by providing the necessary academic and social support services.

One other climatic issue relevant to this discussion is the overall shock most students experience as freshmen on campus, regardless of race, ethnicity, or gender. According to Wratcher (1991), students coming from high school directly to college are expected to assimilate into their new environment with relative ease. However, faced with the lack of institutional support they are accustomed to in high school, students find the academic and social bridge difficult to cross. To help alleviate this assimilation period, Wratcher took a cohort of students and conducted a Learning Styles Inventory test. After completion of the test, students and faculty discussed the results. The findings of this study were that students who went through the inventory and discuss process had a better understanding of their learning styles and were more understanding of their new environment and how they fit in.

Goal and Institutional Commitment

Tinto (1993) suggests that individual commitment to college takes two separate forms: goal commitment, which refers to a person's commitment to his occupational or educational goals; and institutional commitment, referring to a person's commitment to the institution in which he is enrolled. Tinto's theory of goal commitment has been found to be a great determinant in the persistence of students to degree completion, and has been supported by other researchers (Astin, 1975; Cope and Hannah, 1975). Building upon Cope and Hannah's (1975) finding that "personal commitment to either an academic or occupational goal is the single most important determinant of persistence in college (p. 19), Tinto (1993) cites studies by Panos and Astin (1968), Rossman and Kirk (1970), Astin (1975), Weingartner (1981), Bean (1982), Wilder and Kellams (1987), and Rodgers and Pratt (1989) in support of the notion that educational or occupational goals are important predictors of degree completion. In fact, Tinto claims that the level of one's educational or occupational goals are positively correlated with the likelihood of degree completion.

The level of institutional commitment exhibited by a student is dependent upon the congruence between the student's educational goals and the institution's educational mission. Although individuals may enter college with educational goals that are, as Tinto (1975) states, "either more limited than or more extensive than those of the institution (p. 33)," the level of incongruence between student and institution is a primary factor in the student's interest in persisting. Only when occupational or career goals are focused and clear do students persist when their educational goals are incongruent with those of the institution. Tinto (1975) also notes that as time progresses, a student's goal and institutional commitment generally increases as the degree completion becomes more focused.

Astin's (1977) theory of a significant relationship between career goals and student persistence was illustrated by a study which found that students whose major fields were closely associated with their career goals and objectives were more likely to persist to that goal than those students who did not have an identified career goal. In a subsequent study (1982), Astin built upon his previous finding and concluded that career goals and intended major were the strongest predictor of students' plans after intervals of two and nine years. Thus, as Astin suggests, "the student's initial choice of a career or major is not a random event, and that it has considerable influence on the student's long-range career development" (p.96).

In addition to career goals, a student's values are also connected to persistence. Pantages & Creedon (1978) concluded that when the student's values, goals, and attitudes are in congruence with those of the colleges, the more likely the student will persist until graduation. The incorporation of a particular occupational goal also increases this persistence factor in terms of providing additional motivation for the student.

Social and Academic Integration

Much of the literature regarding retention issues focuses on the social and academic integration of students with the university. Tinto's (1975) longitudinal model of student departure posited that the students' level of academic and social integration with the university, in addition to their goal and institutional commitment (described earlier), are the major factors in their ability to persist in college. Building upon Durkheim's suicide theory, Tinto posited that, like suicide victims who were totally removed from the social fabric of society, students who are likewise removed from the social fabric of the college community were more likely to leave college than persist. As Tinto noted,

> In Durkheim's view, individual integration into the social and intellectual life of society and the social and intellectual membership which that integration promotes are essential elements of social existence in human society. Societies with high rates of suicide are those whose social conditions are such as to constrain such membership. (Tinto, 1993, p. 102).

Thus, Tinto's theory of individual departure suggests that the ability of the student to either conform or integrate into the social and intellectual membership of the university is pivotal to their ability to persevere through graduation. Griffin (1992), summarizing the attrition theories of Terenzini & Wright (1987), Spady (1970), Terenzini & Pascarella (1984), and Tinto (1975), further theorized that early integration into the social and academic fabric of the institution is not only correlated with persistence in college, but is also conducive to the academic and social growth of the student. Rootman (1972) and Astin (1987) also subscribe to the theory of social and academic integration, but suggest that the important issue to be considered is the student's environmental "fit" into the social confines of the institution. How a student's values fit in with the institutional values and those of the faculty and student population will reflect on the student by way of the quality of that relationship.

There are a variety of ways that students actually "fit" into the college environment, and also a number of ways that the college can assist that integration. The development of new friendships and peer interaction is perhaps the most recognized method of social integration. This development can help students bridge the often traumatic first weeks of the freshman year and offer other areas of personal and academic support. Several studies, including those conducted by Tinto (1975), Pantages & Creedon (1978), and Astin (1977), have found that friendship support is directly related to persistence in college, and that college dropouts perceive themselves as having less social interaction than those students who persist in college. For African-American students, students who engage in social activities become a part of the social environment and are more likely to persist (Griffin, 1992).

The process of becoming socially integrated into the fabric of the university has also been found to be both a cumulative and compounding process. Terenzini & Wright (1987) suggest that the level of social integration within a given year of study is part of a cumulative experience that continues to build throughout one's college experience. Therefore, the experiences that a student encounters in his freshman year will influence and support their integration in subsequent years.

HBCUs have also been found to provide more positive social support for African-American students that predominantly white institutions offer. Berg & Peplau (1982) concluded that African-American students on black campuses exhibited fewer adjustment problems, engaged in more social activities through their student networking, had higher GPAs, exhibited greater satisfaction in their college experience, and had higher occupational expectations than their counterparts at PWIs.

The establishment of peer relations during college also supports a student's academic integration into the university. Capella, Hetzler, and MacKenzie (1983) found that a positive peer influence favorably influenced the study habits of college students. Several studies, including a 1983 study of exemplary pre-college science, engineering, mathematics, and computer science intervention programs for female and minority students, concluded that peer relationships were important in keeping students interested in the sciences (Matyas, 1991; Malcom, 1983). Many intervention programs build upon this theory of peer support, including UCBerkeley's Mathematics Workshop Program, Xavier's Project SOAR, and UCSan Diego's Summer Bridge Program, all of which encourage group interaction and peer integration.

The development of role models and mentors has also been defined in the literature as important factors of student integration, both academically and socially. A positive role model provides students with a number of equally positive experiences. As

Tinto (1993) suggests, the availability of role models extends beyond the social integration of the student.

> ...it is not surprising that a number of studies have found that social interaction with the college's faculty is related to persistence in college. Spady (1971) suggested that these findings arise from the fact that interaction with the faculty not only increases social integration and therefore institutional commitment but also increases the individual's academic integration. (Tinto, 1993, p. 109)

On the college campus, the important role as role model is often played by faculty members. The interaction between faculty and student has been identified as a major factor in the ability of students to persist in college while also increasing their level of satisfaction (Astin, 1977; Beal & Noel, 1980; Terenzini and Pascarella, 1979). Positive role models provide guidance, direction, and most importantly, a good example for students to learn from. Even more beneficial to students is faculty/student interaction outside of class time. Informal contact between students and faculty members have been found to increase the persistence of the student (Ugbah & Williams, 1989; Griffen, 1992; Astin, 1982). Endo & Harpel (1982) concluded that informal contact with faculty was a foundation for the development of friendly relationships between students and faculty and became a positive influence on students in terms of their personal, social, and intellectual development (Griffen, 1992). Terenzini and Pascarella (1977, 1980) had similar findings, but were unable to duplicate the outcomes at another campus, concluding that each individual campus may react differently to the interactions of variables (Pascarella, 1984).

With regard to underrepresented minorities at the university level, the contact with positive role models is even more significant than for majority students. A study of a mentoring program at Ohio University in Athens, Georgia, found that 91 percent of the African American protégés felt more confidence in themselves as a result of their mentor (Ugbah & Williams).

Unfortunately, the availability of positive minority role models on campus and in our society is not at a level that adequately represents these populations on a national scale. On PWIs, the number of minority faculty is a minute fraction of the white faculty. In Fall of 1987 less than 11 percent of faculty positions were filled by minority persons, the largest representation being 3.2 percent by African Americans (NCES, 1994). In addition, African American instructional faculty in the natural sciences consisted of only 2 percent and less than 0.5 percent in engineering. The other minority groups, with the exception of Asian faculty, had lower representations. Equally disturbing is the fact that minority faculty hold less prominent positions in college and are less likely to receive tenure (The Commission on Minority Participation in Education and American Life, 1988). Even among administrators, this deficiency of minority representation is very evident. Of the 3,800 post-secondary institutions in the nation, only 100 are headed by African Americans (2.6 percent), of which half are HBCUs (Mooney, 1988). These figures, converted to percentage figures, describe an underrepresentation of African American administrators equivalent to only 2.6 percent among all colleges, compared with a national population representation of 12.1 percent (Commission on Professionals in Science and Technology, 1994). Considering that half of these positions are held in HBCUs, the figure of 2.6 percent is more accurately reflected as 1.35 percent of the all non-HBCU colleges (approximately 3,700 in total).

At HBCUs, although the number of African American faculty is higher than at PWIs, there is still a shortage of prepared minority faculty to fill the roles required for students. In fact, if we look at the nation's public schools as an indicator of occupational choice, we clearly must concede that the representation of minority teachers is embarrassing low. The Carnegie Forum on Education and the Economy, in their A Nation Prepared document, predicted that the nation would fall 50,000 minority teachers short in 1994. In addition, Rudner (1987) also accurately predicted a decline in the numbers of minority teachers from 12 percent to 5 percent in 1992. Thus, if the figures presented for public schools are assumed to be commensurate with those of higher education, the promise for an increase in minority faculty at the college level must be a concern.

As Franklin (1988) informs, the lack of positive role models, advocates, and mentors, students has an impact upon students and their ability to do well in elementary and secondary schools. Also, their risk of leaving school is much higher. Therefore, the importance of informal faculty/student contact is more important than ever, and institutions must work diligently to provide positive faculty role models for the students (Justiz, 1994).

The process of academic and social integration is also more likely to occur for students who live on campus. Several studies have shown the positive effects of on-campus residence (Pascarella, 1984; Chickering, 1974; Astin, 1977; Pantages & Creedon, 1978). Pascarella found that even when background traits and institutional controls were held constant, on-campus living was positively correlated with higher student interaction, although he was not able to significantly determine the academic affects. Astin (1977) also found a greater interaction with faculty and peers, and in addition also found that students were more satisfied with college, had more focused career and educational goals, and in turn were more likely to persist to graduation.

Financial Aid

The research regarding how finances impact upon a student's ability or decisions to persist in college is somewhat equivocal. Several researchers, including Astin (1975), Slater (1960), and Spady (1967), have argued that finance plays a significant role in student persistence, especially in terms of socio-economics. These studies have found that students with affluent backgrounds persist at much higher rates than students from lower SES backgrounds. But critics of this viewpoint, including Pantages and Creedon (1978) and Tinto (1993), suggest that finance is not a key factor in determining persistence, but that other factors which happen to coincide with finance, such as lower academic ability, lack of role models, and poor learning environments play a major role in student persistence. Thus, according to these critics, issues of finance are given much more credit than they deserve. Tinto (1993) suggests that citing financial aid as the cause of departure is often a polite way of students saying that they are dissatisfied with their social and academic life on campus.

Regardless, there is considerable research supporting the implication that finances do cause students to leave college, especially for students with lower socio-economic backgrounds, including a large number of minority students. Hamlen (1992) describes a longitudinal study conducted by Boston Public Schools to determine the factors correlated with the poor college graduation rates of their high school graduates. In that study, financial aid was found to be a critical factor to the retention of African-American students more than any other racial/ethnic group. Further, African-American students in the study received less financial aid than any other group, supporting similar findings found in other studies (Copeland, 1984; Council of Graduate Schools in the U.S., 1984; Smith, 1980).

Murdock's meta-analysis (1990) of financial aid studies found that financial policies at the institutional and national level are achieving their objective—assisting low SES students to persist at a rate almost equal to middle and upper SES students, although minority retention is still below that of white students. However, Murdock also concludes that financial aid is only one side of a trilateral solution to minority attrition, and that academic preparation and socio-cultural adjustment must also become major concerns on campus. In addition, Murdock also notes that if the main concern of financial aid is to remove economic barriers, then funding and award amount policies must keep pace with inflation in order for students to better meet their financial needs, regardless of whether emphasis is placed on increased grants or loans.

Research has also found that type of financial aid supplied to a student is a factor in his ability to persist. Studies by Pantages and Creedon (1978), Nora and Rendon (1988), Thomas (1986), and Astin (1975, 1982) are among the literature which suggest that financial aid in the form of grants and scholarships tend to facilitate persistence. Nora and Rendon found that Pell grants in particular have the greatest effects on student retention, with loan and work-study programs second. Thomas (1986) suggests that loans made to minority students are a negative influence on persistence because of the fear of financial indebtedness held by the families.

Four recommendations specific to the financial aid were developed by the Commission on the Higher Education of Minorities, which supported Astin's 1982 study regarding minority progress and persistence in higher education. These recommendations are as follows:

(a) students be given grants rather than loans whenever possible;
(b) students given enough aid so they do not need to work more than half time;
(c) if given financial aid through work study, they work less than half-time and on-campus;
(d) federal and state legislators and policy makers support expanded grant and work-study programs. (Astin, 1982).

Although the recommendations are legitimate, they perhaps reflect the hopes of a prosperous 1980s generation rather than the fiscal realities of the United States in 1995 and the 103rd Congress. The Commission asks legislators and policy makers to support expanded grant and work-study programs, but expansions are quite unlikely during this decade.

Work studies are another reasonable alternative to grants, scholarships, and loans. Work studies, especially those within the major field area of the student, allow the student to earn money while conducting college studies, and also support their learning and encourage further participation in the field. Astin (1975) found that work studies of under 25 hours increases persistence by 15 percent. That rate is even higher if the employment is on campus. When the work becomes the focus of the student, however, persistence is negatively influenced (Astin, 1982; Tinto, 1993).

Another factor that has become a barrier to student aid is the bureaucracy involved in filling out the appropriate aid forms. Collison (1988) suggests that the forms are so complicated that many students never complete the forms, thus eliminating them from the possibility of receiving much aid. Astin's study (1982) concurred with Collison's finding, and went further by suggesting that first-generation students in particular were discouraged from applying for financial aid due to the sheer complexity of the process. For this reason and others, Martin (1985) claims that the packaging of student aid resources is one of the most important duties of the financial aid office at any university, and that the caring attitude of the staff can make the complexity of financial issues a more tolerable, bearable process. In fact, Martin suggests that the financial aid office should go much further in its social support of students. "We all enjoy feeling that someone cares about us and that we are more than simply a matriculation number or a typed name on an award letter" (p. 212). Personal phone calls, money management support, and job-placement services are also reasonable services that should be offered through the financial aid offices at colleges and universities.

Several strategies have been identified in the literature regarding how institutions may develop appropriate financial aid policy. Hauptman and Smith (1994) discuss six strategies for increasing the participation of low-income and minority students in higher education (Table 3). The authors cite low tuition prices as the greatest form of student financial aid that this country offers, allowing most students to consider attending college. Although not all students could afford to pay ivy league tuition rates, state colleges and universities still provide a reasonable tuition price for students. Hauptman and Smith also suggest that financial programs focus on minority students, but quickly acknowledge the political realities of the 1990s in terms of earmarking public dollars based on race and ethnicity.

Table 3. Financial Strategies for Increasing the Number of Low-Income and Minority Students Enrolled in Higher Education

(1) Creating or expanding aid programs designed for minority students only: posits that aid programs for minority students would increase their representation, but also notes that it is difficult to achieve funding for programs that are based on the color of ones skin. Pell grants are more popular because they are based upon SES and financial need.

(2) Maintaining low tuition policies at public institutions: Low tuition is greatest single resource of financial support in American higher education and is the main factor why public institutions have historically enrolled higher proportions of minority students than private college.

(3) Increasing the amount of grant aid that disadvantaged students receive: Feds presently spend over $5 billion year on Pell Grants and other federal grant programs. Ensuring that any increases are aimed at lower SES students and not to raise the median line of funding.

(4) Providing students with earlier awareness of their aid eligibility: students who know that they will be covered financially early on are better off;

(5) Pursuing policies that increase student retention and persistence: apply additional support for support services such as tutoring and counseling. and

(6) Neutralizing the negative impact of borrowing.

Source: Hauptman, A. and Smith, P. (1994). Financial Aid Strategies for Improving Minority Student Participation in Higher Education. In Justiz, Wilson, and Björk (Eds.) Minorities in higher education. Phoenix, AZ: Oryx Press and ACE. pp. 78-106.

The National Association of Student Financial Aid Administrators (1983) established a set of guidelines for developing financial aid policy at institutions. Within their ten recommendations, the NASFAA proposed that it was important for institutions to adopt equitable packaging policies identifying the types of aid available, the amounts, and the process involved in attaining student aid. In addition, student aid should be determined using an approved need analysis system and be awarded to students that are truly considered to have the greatest need for the assistance. The bottom line of the association's recommendations is the responsibility on the part of the institution to develop consistent policy and practice that support equity in student aid and student assistance.

Finally, there are other alternatives to supporting students through college. Recently, many states and institutions have developed savings plans and bond issues to save for a child's future education. In Michigan, the Michigan Education Trust Tuition Prepayment Plan (MET) allows parents or anybody else to pay college tuition costs in advance by purchasing a certificate redeemable for four years' tuition and fees at any of the state's 15 public four-year colleges and universities or 29 community colleges (Carter, 1989). Wyoming has a similar system which makes it possible for parents to lock in the current tuition and room and board costs by setting money aside now. The in-state rate of $5,114 per year (1989) will escalate to $24,272 by the year 2003, but parents who lock in will only have to pay the original amount . Some institutions are developing their own prepayment plans: USC in California allows students and families to avoid inflation by prepaying a four-year educational program through cash payment or loans. Congress has also introduced bills that provide for national education savings bank, where parents can buy bonds.

The issue of financial aid is a serious issue to many students. How it relates to student persistence is not altogether clear, as has been suggested in the literature. Regardless, institutions must concern themselves with the financial well-being of the students to ensure that their concentration is on studies rather than finances.

PART II PROGRAM STRATEGIES AND COMPONENTS

Part II of the literature review will focus more on the practices and interventions that have been developed and implemented in order to positively affect student persistence at college. Discussion in this section will include interventions to support the academic and social integration of students, issues involving the recruitment and admissions offices of the university, the development of curricula and pedagogy in the sciences, and student monitoring practices.

Academic and Social Interventions

Review of the literature reveals several interventions and programs which help ameliorate the effects of academic unpreparedness and increase the social and academic integration of the student on campus. In this section we will briefly discuss five of these activities: Counseling, tutoring, mentoring, orientation, and social support.

COUNSELING

Although counseling is not new to colleges and universities, there is a new realization of the importance of counseling. Richardson and Skinner (1992), Padron (1992), and Justiz (1994) all found that counseling, in addition to mentoring and tutoring activities, were extremely beneficial to first-generation college students, and may help enhance the first-year experience. Counseling practices may also be an important part of student tracking exercises by the university in providing an ongoing liaison between the student and the university (Palmer, 1990). Steinmiller & Steinmiller (1991) illustrate that the counseling department at Henderson State University is key to the success of their retention program for at-risk students, where students must submit weekly reports to the Academic Assistance Program Retention Office and schedule numerous appointments with faculty, counselors, and advisors during the semester.

It is important, however, that "counseling" not be oversimplified. There are four basic types of counseling that are encouraged in institutions interested in increasing retention: academic, career, social, and financial. Academic counseling provides students with advise and information regarding their course selection and progression throughout their college career. The academic counselor is responsible for assisting the student with the most prudent choices during their academic career. Astin (1994) suggests that in association with student screening practices, academic counselors place students in courses that are appropriate to their level of ability. Habley (1981) found that African-American students perceived academic counseling as their most important campus resource. Career counseling works together with academic counseling to ensure that students are studying what they are truly interested in as well as making the appropriate maneuvers to ensure that they reach their goals. Social counseling resides more in the traditional realm of psychological and sociological science, and provides students with the psychological support necessary. Finally, financial counseling helps students seek additional financial support in addition to helping students budget their money appropriately.

These counseling practices are an important aspect of the minority students experience. As Trippi & Cheatham concluded in their 1989 study of a large PWI, the following counseling services were the most beneficial to their academic performance:

(a) establishing a counseling relationship soon after freshman matriculation

(b) actively resolving specific, concrete, short-range concerns using action-oriented interactions

(c) maintaining an ongoing counseling relationship that engaged in addressing long-term development activities (e.g. academic skills development); and

(d) recognizing the limited utility of "intrusive" counseling.

TUTORING/MENTORING

Tutoring, as with counseling, has also been an important part of coll providing students with an opportunity to work with someone who ha the material, students in an individual or small group format can work th of their academic difficulties if given appropriate time. Studies have found that the use of tutoring personnel on campus can make significant improvements in students' work and is directly correlated with an increase in persistence (Wepner, 1985). In a active tutoring at universities can assist students with difficulties in bud studying effectively, and put in perspective the source of their academ (Bandalos & Sedlacek, 1985; Jones, Harris, and Hauck, 1975).

Tutoring is often provided by peers who are more established in the perhaps experienced undergraduates or teaching assistants. While the use of p is almost considered a tradition in U.S. schools (Gahan-Rech, Stephens, & Buchalt 1989), it is also an important resource for colleges. The use of peer tutors has a double impact on students: not only does it assist the student academically with but it also integrates students into the academic and social fabric desc Programs such as Uri Treisman's Mathematics Workshop Program utiliz and interaction to form strong, cohesive study groups that encourage academic excellence and problem solving (Fullilove & Treisman, 1990).

As noted, tutoring is most often used to assist students with specific academic difficulties. However, the breadth of tutoring is beyond basic course work. Many tutoring programs also focus on study skills, note taking, listening skills, communicat

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[illegible] ess in college. Several studies have show[illegible] mic skills are important to the mastery of [illegible] Martin [illegible] 1990). In terms of minority students, [illegible] and the [illegible] elopment of efficient study skills were high[illegible] [illegible] itional students.

Th[illegible] d at University of Missouri-[illegible] in 1[illegible] cellent example of an academic [illegible] rogram, contributes tutoring-like experiences for [illegible] At UMK[illegible] program is structured to support the hierarchy of student learning as defined by Martin et al. (1990) and illustrated in Figure 3. Dr. Martin describes the hierarchy in terms of its effectiveness. Remedial courses, for instance, are th[illegible] of meet[illegible] students needs. Tutoring is a second level int[illegible] SI provides for learning activities to rein[illegible] f teaching strategies and curriculum. Th[illegible] over 1,100 institutions nationwide, provides [illegible] academic support for students beginning the first week of class and is [illegible] all students on a voluntary basis. Surprisingly, participation in SI at UKMC has be[illegible] al across all levels of students, with the same number of students from low and [illegible] score quartiles enrolling, but the program tar-[illegible] D and F grades. By developing the stu-[illegible] to learn, the SI program has been [illegible] to the number of course withdrawals [illegible]

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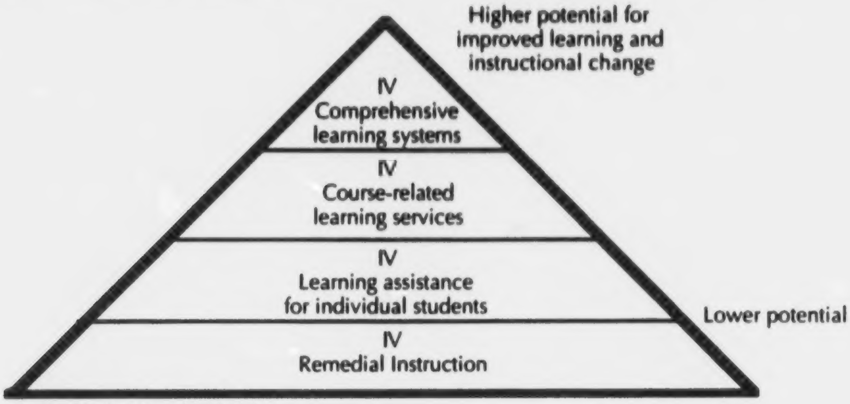
Figure 3. The Hierarchy of Learning Improvement Programs


Higher potential for improved learning and instructional change
IV
Comprehensive learning systems
IV
Course-related learning services
IV
Learning assistance for individual students
Lower potential
IV
Remedial Instruction

Source: Martin & Arendale (1990)

ORIENTATION PROGRAMS

Freshman student orientation is an important occasion in terms of a student's college experience. Unfortunately, according to Tinto (1993), most orientation programs stress information dissemination and disregard issues of social importance to the student. Tinto also suggests that orientation programs fail to provide information in such a way that it fosters the development of social relations with faculty and peers. A more appropriate orientation program according to Tinto would be the following:

> Here in the realm of interpersonal affiliation lies one of the keys to effective orientation programs, indeed to effective retention programs generally. Namely, that they go beyond the provision of information per se to the establishment of early contacts for new students not only with other members of their entering class but also with other students, faculty, and staff. In this manner, effective orientation programs function to help new students make the often difficult transition to the world of the college and help lay the foundation for the development of the important personal linkages which are the basis for eventual incorporation of the

> individual into the social and intellectual life of the institution (Pascarella, Terenzini, and Wolfle, 1985). (Tinto, 1993. p. 159)

What Tinto espouses is the importance of orientation programs in regard to the social integration of the student. Building upon his theory of academic and social integration, the immediate forging of bonds between freshman students and faculty assists the development of a social comfort that helps bridge the gap from high school to college. Orientation programs can assist in bridging other gaps as well, including the adjustment from rural life to urban, small schools to large institutions, and other equally potentially difficult adjustments for students.

Several colleges and universities across the country have developed successful orientation programs to help ameliorate the adjustment process for students. The University of South Carolina's Freshman Seminar Program, entitled University 101, was developed to help retain African-American students through their freshman year (Fidler and Godwin, 1994). As opposed to many orientation programs which consist of a few days at the beginning of the semester, University 101 begins with a one-day summer advisement session where students learn about course sequence and registration. During the fall, students then volunteer to take the 3-credit hour offering, which includes discussion of freshman issues, guest speakers, introduction to on-campus resources, field trips, and social functions. Students enrolled in the USC program historically return to the university in their sophomore years at a rate 6 percent higher than non-participants.

The use of the Learning Styles Inventory at Carnegie Mellon University described earlier is also a unique method of orienting students to their new culture (Wratcher, 1991). By meeting with students and discussing their learning preferences and introducing the support systems on campus, the student becomes more aware of his or her potential on campus and where they may find support.

Summer bridge programs also offer an excellent way of orienting future students to the campus environment. The Summer Bridge Program at UC San Diego brings admitted students to the campus for a three-week residence program the summer before they enroll. In addition to providing additional academic experiences, students become familiar with the campus surroundings, resources, and begin to form relationships before the stress of fall classes begins (Levin & Levin, 1991).

SOCIAL SUPPORT

Although campuses exist for the academic growth of its students, no campus is exempt from the responsibility of providing an appropriate social environment for the student. As we have seen from our review, the impact of social environment on student persistence is well documented. Colleges and universities can foster this social growth by providing opportunities for students to assemble and mix. Allowing and coordinating Student Associations, fraternities, and other student groups can assist this process (Billson & Terry, 1982; Astin, 1977; Slocum, 1956). In fact, student groups can be used to help develop other social efforts that promote social integration and college persistence. Upcraft (1985) recommends that student government, special interest groups, and other groups be called upon to help develop, promote, and implement student activities on campus. Upcraft's rationale is that the involvement of students will create a greater ownership over the events as opposed to a university-generated event. Astin (1977) attributes athletic programs, student government, student-faculty interaction, social fraternities and sororities, and on-campus residence with greater persistence and social integration. The campus can be instrumental in providing all of these opportunities by: setting up inter-school and intramural athletic activities; incorporating the role of student government into structure of the university; creating opportunities for faculty to meet with students informally; establishing a fraternity row and allowing fraternity activities on campus; and providing the capacity for students to live on campus, especially freshman.

Delivery of Interventions and Programs

The delivery of retention interventions and programs may happen in any of a number of ways, but quite often they may be categorized as either a pre-college, summer bridge, freshman year, or continuous type of intervention. The title of these categories refers only to the time of delivery, and has little or nothing to do with the content of the program. In fact, many of the interventions discussed previously, such as tutoring and mentoring, may be an important feature of all delivery systems. Following is a brief explanation of each category.

PRE-COLLEGE PROGRAMS

Pre-college programs are delivered to elementary and secondary students, and while they cannot be considered "retention" efforts, they are important components of a university's recruitment program. Not only does the pre-college program identify potential students, but it is an effective student motivator. In terms of the sciences, pre-college programs may be an important tool in motivating nontraditional science students (i.e., girls, minority children) toward a science-related career through fun activities. In addition, pre-college programs may provide academic support, career counseling, role modeling, and an introduction to college life for the participants.

Examples of pre-college programs that have been extremely effective in these regards include the MSEN program out of University of North Carolina, Chapel Hill (grades 6-12), the MESA program in California (grades 4-12), and Xavier University's ChemStar, BioStar, and MathStar programs (High School). Further information regarding these programs may be found in Appendix B.

SUMMER BRIDGE PROGRAMS

Summer bridge programs are offered to students who have already been admitted to the university, but who either chose to or were required to take the bridge for academic reasons or because it is a required portion of freshman year. Summer bridge programs act as an excellent orientation for the fall semester, and allow students to get comfortable on campus before the onslaught of students in late August. Primarily, summer bridge programs focus on academic skill development, such as study, note taking, time management, writing, and listening skills, but may also include particular discipline-related instruction or remediation, such as pre-calculus or physics.

Xavier University is well recognized for its bridge program. Project SOAR (Stress On Analytical Reasoning) is an intervention tool designed to increase minority freshman retention by increasing students' performance levels in introductory courses. In addition, Project SOAR also provides motivating activities, field-trips, career counseling, and social activities (Ryan, Robinson, and Carmichael, Jr., 1980).

FRESHMAN YEAR PROGRAMS

Freshman year programs operate within the freshman year, and often are conducted either within the first several weeks of school or the first semester. In addition to applying the academic support activities evident in other interventions, freshman year programs most often deal with issues related to the freshman year, such as social adjustment issues for students. They may operate completely separate from the academic calendar or be designed into the calendar. University of South Carolina's "University 101" program referred to earlier is an example of a freshman year program which is given academic credit (3-credit hours). The Supplemental Instruction developed out of the University of Missouri-Kansas City provides an example of an academic program designed almost exclusively for freshman students (89 percent freshman). Freshman programs act as excellent diversions to attrition and support

Braddock's (1992) claim that intervention is most effective at the stage where the greatest exodus of students from the university occurs.

MAINSTREAM

The mainstream retention efforts at colleges are generally open to most students and are provided at any time during the student's college career. Student academic support in the form of tutoring, peer learning activities, and supplemental instruction are common mainstream offerings, as well as social programs such as counseling, social functions, and extracurricular activities. The University of Minnesota operates an academic support program for minority students within the technology areas(engineering and sciences), which includes tutoring, study skills, and other interventions to support students during the academic year (Birmingham, 1995).

Recruitment and Admissions

The recruitment stage may be the most critical phase of the college years for both student and institution. Stated previously was the importance of goal congruence between the two. The recruitment stage is the point where students and institution formally acknowledge their goals and missions and establish a relationship to determine whether the "fit" is good between the two. As Tinto (1993) suggests, recruitment and admission is the "first formal contact" with the institution for the student, and therefore is where students form their first impression of the social, academic, and intellectual character of the campus. Unfortunately, Tinto acknowledges that many institutions paint a "rosy" picture of their campus to gain enrollment figures, rather than focus on attaining goal congruence. Thus, institutions should "recruit for retention" rather than for enrollment figures (Noel, 1978). The impact of inappropriate recruitment is felt later when attrition rates balance out the equation for this lack of congruence.

Many institutions utilize what is called a "blanket recruitment" approach. As described by Cota-Robles (1992), this approach "employs traditional efforts such as widespread distribution of posters and brochures, name exchanges, and participation in graduate fairs" (p. 104). Unfortunately, Cota-Robles also contends that this is a very ineffective method of recruitment, which is also substantiated by Thomas, Clewell, and Pearson (1992). Rather than blanket recruitment, many institutions have been effective with more personal contacts with students. Students should be given the opportunity to gain a better understanding of the campus. Ihlanfeldt (1985) contends that the strategic planning objective of the university should be to create a better fit between the institution's environment and various markets (i.e., potential students) and then communicate this fit to the student. This will allow the institution to fulfill its mission while also engaging students who fit this mission. Thus, as Ihlanfeldt remarks, the admissions department must play the role as communicator rather than the sales force.

In terms of marketing for recruitment, Ihlanfeldt (1985) clarifies the types of markets available to universities. In particular, Ihlanfeldt uses the terms "national," "regional," and "local" to describe high schools in terms of the geographic location that they send their students to college. A high school that send students to colleges around the country are termed national schools. A national high school sends students to universities all over the nation, and will send between 90 and 95 percent of their graduating class on to higher education. As may be inferred, these schools are found in the more affluent neighborhoods of the nation. Ihlandfeldt describes a school that sends students to colleges within the state (generally within 200-300 miles of their home) as regional. The regional school sends between 40 and 60 percent of their graduating class to higher education. A school that send students almost exclusively to the local area college or university is described as a local school. The local school is located in the same town as the university or college, and will send only 20 or 30 percent of its graduating class on to college. As we work down each category, the socio-economic status of the student and family also work down the scale, with local schools having the lowest SES. Universities are similarly categorized. Very simply put, there are the national universities which recruit across the nation (Ivy League and others), regional universities which recruit within a 200-300 mile radius, and local universities, or "commuter" universities, which recruit locally. The point of Ihlanfeldt's discussion is that the university must identify which classification it is in or wants to be in, and develop a marketing strategy to ensure that the appropriate market is attracted. Many of the minority institutions fall into the regional market, and therefore should focus on students who fall into the regional category rather than spend greater dollars per recruit marketing beyond their scope. As Ihlanfeldt explains,

> A regional institution should focus nearly all of its efforts within its primary market area except for a limited direct mail effort in secondary markets, and Alumni should be used to follow up on a personal basis in the secondary markets. (p. 197)

In order to develop an appropriate strategy for this market, Ihlanfeldt offers the following strategies:

(1) Focus upon the primary market within 300-mile radius

(2) Develop an early contact program to increase the name recognition and visibility of the institution

(3) Develop a database of freshmen and sophomore addresses by market, school.

(4) Use direct mail as frequently as necessary

(5) Develop an alumni admissions program in five to ten cities.

(6) Make a limited number of well-targeted secondary school visits n the spring. Should be directed toward sophomore and juniors.

(7) Reduce number of secondary school visits.

(8) Offer on-campus Sunday programs in the fall and spring for prospective students and their parents who live within the immediate area, and a Sunday to Monday overnight for students outside immediate area.

(9) Use enrolled students to contact prospective students locally.

(10) Host off-campus programs in a neutral environment (hotel).

(11) Host on-campus workshops for teachers and counselors from high schools and community colleges (transfer students).

(12) Visit homes on a selective basis of talented prospects

(13) Establish a hometown news release program that sends mail on a timely basis.

(14) Summer camp programs and corporate workshops on campus can offer great opportunities to promote the institution. (p. 200).

As can be seen by the list, an important part of the recruitment process is the personal nature of the contact. Direct mail, extensive use of the alumni, incorporation of high school teachers and counselors, visiting homes, and hometown news release programs are all an essential part of establishing a personal relationship with the prospect. This approach follows the research of Tinto (1975), Pantages and Creedon (1978), and Beal and Noel (1980), who are among many researchers who suggest that personal concern is an important factor in the social integration of the student.

Braddock (1992) suggests that there are seven basic stages to the recruitment process that a university must follow:

1. Define the pool of qualified individuals
2. Recruit applicants
3. Screen out applicant who do not meet the qualifications
4. Select the most acceptable applicants

5. Persuade recruits to accept offers to pursue careers or advanced study in a field
6. Train and socialize recruits
7. Provide opportunities for recruits to make a smooth transition.

Braddock (1992) notes that this seven-stage process is both cyclical and cumulative, and that barriers that for minority candidates at any stage may constrain their availability at other stages in the process (p. 36). In addition, the pipeline of students that are available in the first stage ('Defining the pool') will dwindle down to only a few candidates by stage 7. Thus every stage is critical to keeping the pool active in the recruitment process. As John Hope Franklin (1993) states in The Inclusive University,

> If colleges and universities were to beat the bushes for bright young blacks the way they do for strong young blacks—that is, if they pursued scholars as zealously as they do athletes—the pool of college-bound youth would be much larger. (p. 20).

It is the responsibility of the university to ensure that the pool, or market using Ihlanfeldt's terminology, is actively recruited to the university and department. This responsibility will surely become more important and more of a concern for recruitment and admission personnel in the next decade considering the 30 to 40 percent drop in eighteen- to twenty-four-year olds across the country since 1985 (Ihlanfeldt, 1985). This drop in the overall size of the college pool will dramatically affect each discipline, department, and university drawing from that pool.

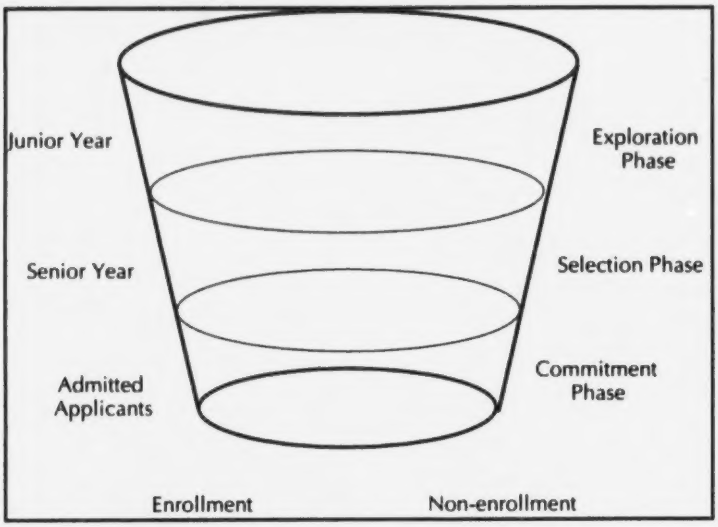
Several universities have established interesting and effective recruitment strategies for minority populations. The University of Florida organized a special department to recruit new students into the teaching profession, called The Office of Recruitment and Outreach (Johnson, 1988). A key component to the University of

Florida strategy is the 'outreach' component, which involves contacting local fraternities, sororities, churches, and other organizations to help generate student interest in teaching. Contacting educators at community colleges and high schools as well as attending regional conferences were strategies utilized by the ORO. Institutions such as Syracuse University (The Lubin House Experience) (Elam, 1989) and Project Uplift at the University of North Carolina in Chapel Hill (are examples of efforts that take the university out to the community rather than rely on internal visitations and traditional methods (See Appendix B). The use of 'mixers' and social events to attract both students and parents to universities may be successful information dissemination exercises when executed effectively. At Lubin House in New York City, social evenings are planned to aid families that have neither the time or money to travel to Syracuse University.

The use of innovative and aggressive recruitment methods at both Syracuse University and UNC help attract the minority student to those two institutions. One method used at both universities is that of the 'mini-university.' For one weekend, senior high school students are given the opportunity to visit the campus, sleep in the dormitories, eat in the dining halls, and attend special events, classes, and orientations. This effort provides the student with a 'feel' for the campus, and these well-organized events often act as a catalyst to the final college selection for these students.

Since recruitment for the academically successful minority students among universities is very competitive, recruitment must begin long before high school graduation. At Syracuse, the Lubin House experience begins when the students are in their junior year (see Figure 4). The three stage recruitment program begins with an 'exploration' phase during initial contact, providing important information for the students and parents regarding the program offerings, financial aid, and campus life. The second stage, called the 'selection' phase, takes place in senior year and establishes further contact with the family while also providing more detailed information regarding program requirements and support. The final 'commitment' stage, as with the previous selection phase, further delineates the program information toward the specific needs of the student. Fine details are taken into consideration at this point, including course selection, establishing financial aid, and living conditions. Although the university makes great efforts to recruit the top minority students, students who have shown the potential to succeed in higher education, but would not normally be selected through formal application processes, are forwarded to the Higher Education Opportunity Program (HEOP) at the University, which provides financial support to students who fit the appropriate description.

Figure 4. Syracuse University Recruitment Process



Source: Elam, 1989

Other programs to be discussed later in this document include academic enrichment programs offered at both the elementary and secondary levels of education by institutions of higher education. This practice has become much more common in the past decade, and has been utilized as a successful recruitment approach by Xavier University, the University of North Carolina, and the University of California at Berkeley among many others. These institutions have come to realize that the successful recruitment of students depends on expansion of services to the preliminary sectors of the pipeline. By providing students with opportunities in their formative years, students develop better academic skills, an increased desire in the sciences, an increased appreciation for the education process and learning, and become more aware of the opportunities that come with a college degree. While there is no guarantee that these students will graduate from high school and go on to the originating college, these enrichment programs have proven to increase the SEM pool nationwide. However, the unique advantage of these types of programs, as far as the institution is concerned, is familiarizing the student with the character of the university campus. After spending six weeks on a college campus, 12-year old students often develop affinities for that institution, and long for the opportunity to become a full-fledged college student.

One final note is regards the use of standardized admission testing. Astin (1994) has long been an opponent of the misuse of standardized instruments as predictors for college persistence and excellence, and states that the use of high school grades and test scores for prediction of college success do not hold up under scrutiny. Specifically, African American and Hispanic students are put at a competitive disadvantage on such tests compared with other students. Astin cites a study conducted by Harris (1970) which concluded that because a student receives mediocre grades in a particular course offering does not conclude that the student did not learn as much as another student who scored higher. Based on this observation, Astin suggests that a "talent development" viewpoint be developed at institutions to incorporate the net academic development of a student during their course work. That is, a "before and after look" at their progress in college. This way, an institution could be rated on how well it "develops" a student based on their ability at admittance.

Curriculum and Instruction

Much of the literature review has focused on issues related to issues of student integration, both academically and socially. One issue that must not be forgotten in all of this is the underlying rationale for the university—learning. Between the curricula offered in higher education and the instruction of that curricula carries the potential of students' achievement after they graduate from college.

Universities have not been noted for their use of exemplary instruction techniques, and perhaps the traditional lecture method is most connotated with higher education. Sheila Tobias, in her book They're not dumb, they're different (1990), discusses the problems with science instruction in college. The poor instruction of introductory, or "gatekeeper" courses, which as Tobias exclaims are "unapologetically competitive, selective and intimidating, designed to winnow out all but the 'top tier" (p. 9), is a factor that has received considerable attention in the past few years. Traditionally, professors and instructors force feed students and leave the entire learning process in their hands rather than supporting and encouraging students to persist in the sciences (especially when many students have not identified majors at the freshman stage). As Tobias comments,

> For many scientists...it seems more logical to begin with pure substances, (the nation's six-year-olds) and uniform initial conditions, than to flounder in the messy bog of motivation, attributes, and prior training exhibited by postsecondary students in their early years at college (p. 9).

Roueche & Roueche (1985) suggest that the instructor is the most pivotal contact in the educational process, and regardless of other important impacts and considerations, must become and remain the key ingredient to a solid educational foundation.

> No matter the organizational or programmatic efforts made to set higher standards and to more closely evaluate educational outcomes, the unquestionable pivotal point in the educational system has been, and will always be, the teacher (p. 283).

Roueche and Roueche (1985) identify three "human and professional" criteria that instructors need to possess in order to foster teaching excellence. First is the love and concern for others. It is highly unlikely that a teacher will exhibit much caring for either course content or the course participants if there is not a good-natured attitude within the individual. Second, the teacher must have the ability to create a positive learning environment. This involves entertaining some of the factors identified by Tobias, including motivation and a comprehension of students' previous learning. Third, the teacher must be committed to teaching as a profession, rather than as an aside to research. Although research institutions may have a different set of priorities—a set that does not elevate teaching to the zenith—they must change their attitude toward the teaching process and begin to support the academic and social needs of the students.

In a 1985 study of the attributes related to personal excellence, Bloom studied 120 superstars—athletes, musicians, artists, and scientists—to identify what similar experiences they had during their lives to support their climb to greatness. The findings exhibited that there were similar experiences among this class of people, most important of which was the 'child oriented' philosophy of their parents. The parents of almost all participants in Bloom's study made personal sacrifices for their children and encouraged their children to participate in activities (Hyman, 1988). Bloom, based on these findings, reasons that a teacher must have these same attributes: they must be caring, responsible people who "must be almost like a wonderful mother; nurturing, supporting, and encouraging" (p. 71). Although this example relates more to the adolescent child, there is no reason to believe that these same attributes are not necessary components and conditions of an effective learning environment. The hands-on interest of a faculty member, as discussed by Tinto (1993) and others, can have positive ramifications on the student's self concept and progress. Of course, it is equally important to note that the institution must support and encourage this type of activity on the part of the instructor. The push for tenure at many institutions also implies the ability to acquire research grants, write publications, and promote the university. Xavier University in New Orleans has made a point of rewarding their teaching faculty for prowess in the classroom rather than just in their ability as researchers (Petersdorf, Nickens, and Ready, 1990). Other such reward structure revision is imperative if university instructors are to take more responsibility in their instructional techniques and the outcomes of their students (Justiz, 1994; Sawchuk, 1991).

Many individuals and institutions have also decided to make changes to the traditional methods of college instruction. Again, Xavier University is among those institutions which have revamped their pedagogical methods to support student academic needs. Xavier redesigned their approach to instruction based upon Piagetian theory and a format designed by Karplus (1977) entitled "Learning Cycle format," which incorporates three distinct phases of learning: exploration, invention, and application (Whimbey, Carmichael, Jones, Hunter, and Vincent, 1980). This effort works contrary to the lecture methods prominent in higher education by first exposing students to situations and letting them experiment and ford their own theories as to why certain events occurred. This 'hands-on' approach has been successfully introduced at many colleges. Fullilove and Treisman (1990) developed a program at the University of California at Berkeley built around the use of small learning groups and focused learning activities. The Mathematics Workshop Program uses worksheets, homework, and active learning labs to develop an enhanced atmosphere of learning at Berkeley. The program was developed after research showed that African American students often studied in a void, as compared to Asian American students who studied in cohort groups. As anticipated, the Asian students earned much better grades and were more comfortable with the content than their African American counterparts. Thus, the MWP program pulls students into peer groups and encourages group interaction and studying. Evaluations of the program have documented the apparent success of the program, and Treisman has moved to the University of Texas at Austin to replicate the program, which has also shown similar success.

The use of small group instruction, according to Hyman (1988), allows an individual learner to become comfortable with the group and develop a sense of belonging, progressing Tinto's (1975) theory of social integration. Through these peer groups, learners can experiment with new methods of analysis and problem-solving that they otherwise would not have been subjected to. In addition, such group interaction promotes heterogeneity on campus. Levin and Levin (1991) also support the use of integrated study skills approaches, and suggest that these approaches are successful because they destroy a student's false perception regarding his academic problems.

Monitoring Student Progress

The issue of student monitoring, or "tracking," as it is sometimes referred to, is becoming an increasingly important factor in providing students with the resources and interventions required to aid their persistence at the college level. The use of monitoring system allows several events to take place. First, it allows university personnel to follow a student's progress and anticipate an expected need on behalf of the student. For example, a student's downward spiral of grades in physics, if identified by a faculty member or other staff member, can issue a warning that the student requires tutorial assistance and support in order to get back on track. However, unless someone or some department is privy to the appropriate information, this student, like countless others, are likely to "fall through the cracks."

A student monitoring system is also necessary in terms of assessing the impacts of interventions and other retention strategies. Tinto (1993) suggests that the development of such a system must first be student-centered. That is, it must collect information on every aspect of student development and focus on that progress. The collection of information provides the institution with a "snapshot" of student progress, and according to Tinto, should detail the social and academic experiences of the student, "as understood by students" (p. 214).

Tinto's (1993) description of a retention assessment system emphasizes three main requirements in order to be successful: the system must be comprehensive, longitudinal, and recursive. Tinto suggests that the system incorporate both quantitative and qualitative methods of data collection to ensure that a representative portrait is developed of each student. Surveys and other instruments can collect important information on student progress, but are susceptible to low response rates. The use of qualitative methods, in the form of focus groups, interviews, and other designs help fill information gaps and triangulate the information. The use of unobtrusive techniques is also an interesting method of gaining insight into student progress. Tinto gives the example of residence hall staff who are responsible for noting the frequency of home visits by a student per semester and of how many visits from the parents are made. In addition, noting the wall hangings and paraphernalia in a students room and dorm hallways may also be an indicator of certain student issues or needs.

The second criteria of Tinto's (1993) is the longitudinal process. As Tinto states, since the process of student withdrawal from higher education is longitudinal in nature, so must student assessment. Therefore, collection and monitoring of student progress must involve more than the freshman experience, and preferably commence before students are officially admitted to the college. The advantage of this practice is that school officials may become aware of potential needs before the student comes to the campus. Thus, the college can prepare in advance for the social and academic needs of each student. Tinto also acknowledges an important aspect of pre-enrollment information. The collection of student information before matriculation allows researchers (administrators) to separate the effect of pre-entry attributes from the effects of college life on the student. This is an important part of the retention and student assessment process.

The third criteria for a student retention system is that it must be recursive. That is, the process cannot stop after one particular cohort of students, but rather, must be part of a continuing process of data collection in order to develop university-wide trends among the student body. This step will allow for the constant improvement on the part of the institution. Several universities have either developed systems to monitor student progress or are in the process of this development. The Colorado Commission for Higher Education developed a student cohort tracking system in 1989-90 to assist the increased participation of minority students in higher education (Colorado Commission on Higher Education, 1990). The system comprises all of Tinto's three criteria for an assessment system, in that it compiles information on every student enrolled in post-secondary studies within the state and updates that information on a semester basis. Where the system lacks the ability to incorporate much of the qualitative and personal information described earlier, it makes up for this inadequacy in the sheer breadth of the process. The major files (or records) coordinated in the system include a master file in addition to files describing enrollment, financial aid, degrees granted, and undergraduate applicant information for both freshman and transfer student.

In developing the system, the CCHE followed five specific steps: (1) determine the purposes of the system; (2) determine what data would be collected and priorities; (3) establish procedures for extracting and manipulating data; (4) establish procedures for maintaining and manipulating the database; and (5) present results so that decisions can be made about academic policy.

The University of Wisconsin-Madison has also developed a new data control system that automates and tracks information regarding graduate student progress (Steinich and Beecham, 1993). The Graduate Academic Satisfactory Progress (GASP) system has an automatic inputting system of new information through automated reports. GASP allows for the automatic updating of Ph.D. preliminary exam information, graduate student information transactions, and the monitoring of students grades.

PART III PROGRAM DEVELOPMENT AND IMPLEMENTATION

The development, organization, and implementation of a retention program is perhaps the most significant effort that a college and university will make. As will be described, the development of a program will rely on the ability of the campus to recognize the problem and choose to act. But that is only part of the issue. In addition to the recognition and development of a retention program, the implementation of the program is critical to any success that may be garnered in the future. This section of the literature review will discuss these issues and synthesize some of the most influential advice and conclusions relating to these issues.

Characteristics of Effective Retention Programs

A number of studies have suggested the classifications, categories, or types of programs to include in a retention program. But before these issues are discussed, it is important to understand other issues regarding retention programs. For instance, when should the retention program begin at the college level? Armstrong-West and de la Teja (1988) suggest that a comprehensive retention program should start with pre-admission exercises and continue through to post-graduation, with particular emphasis on the freshman year ("frontloading"). By beginning a retention program before matriculation, the institution has a great opportunity to identify, mold, and prepare students for the academic and social conditions of their campus. Building upon what Tinto (1993) suggested regarding retention assessment and student monitoring, all programs and interventions that are conducted at the pre-college stage (i.e., summer bridge programs as well as high school, middle school, and even elementary school interventions) give the institution an opportunity to sew the seeds of future cohorts of students. In terms of student data, institutions can continually monitor students at the secondary level, even though college admissions does not know the future decisions regarding the students. In terms of the conclusion of the program, it is difficult to say when a program should conclude. The pursuit of institutional quality and commitment to the student would suggest that the outcomes of student learning would not truly to be measurable until it is seen what that learning provides the student in "the real world." With this concept in mind, Tinto (1993) suggests that programs follow the student beyond graduation, and coordination with alumni groups and alumni associations is a unique method of continuing any tracking.

The retention program should also be targeted not only to those that expressly need it, but to all students. Although it is often necessary to develop specific programs targeted to different populations on campus (Tinto, 1993), most programs will relate to most students. However, flexibility must be built in to all programs to support the individual nature of the student and their race, ethnicity, socio-economic status, and other factors.

In terms of commitment, Flannery et al. (1973) state that any effort to reduce attrition must be "viewed as a total effort and related to all personnel policies and procedures. Smith, Lippitt, and Sprandel (1985) suggest that the various subparts of a campus must work together in order for a retention effort to be successful. These reports and others support the inclusiveness of all faculty toward the goal of the program. The issue of bringing all "subparts" together will be discussed later.

There is much literature pertaining to the structure or components of a retention program (Levitz & Noel, 1985; Armstrong-West and de la Teja, 1988; Tinto, 1975, 1987, 1993; Cope and Hannah, 1975; Astin, 1975; Pantages and Creedon, 1978; Edmonds and McCurdy, 1988). Most of the literature focuses on programs or interventions involving one or many of the following activities: orientations, academic bridge, mentoring and tutoring, peer counseling, diversity training, student-faculty interaction, academic advising, extracurricular activities, study skills, exam reviews, curriculum and instructional strategies, and many others. In fact, the preceding sections discussed many of these strategies. Two models in particular are worth noting—not because they are better, but because they offer a different view of the issue of educational excellence, campus change, and student retention.

The first model was developed by Forrest (1982) and is extracted from Levitz and Noel's Increasing Student Retention (1985). Forrest identified six operational features for institutional change, and not specifically devoted to retention support, although the two are somewhat synonymous. The six features are:

- Substantive academic advising and orientation
- Sufficient depth and breadth of general education component
- Instruction focused on relevant skill development
- Student-oriented goal statements and proficiency examinations
- Campus-centered environment during the freshman year
- Evaluation of the institution's ability to increase student competence.

(Levitz & Noel, 1985, p. 348)

The Forrest model was included because of its simplicity. Although it does not get into the depths of institutional change, it does state the key ingredients to student support and institutional evolution. The factors that create the foundation for change, according to Forrest, are the student-oriented and campus-centered factors. Keeping these two factors at the center of change will ensure that change is directed and focused.

Table 4. Major Components Identified Which Reduce Attrition for Minority Engineering Students

The Retention Task Force of the Committee on Minorities in Engineering entitled "Retention of Minority Students" in 1977, identified the following factors in rank-order:

- Tutoring supplemental to that normally provided
- Advising supplemental to that normally provided
- Minority engineering student organizations
- Career guidance
- Work experiences—co-ops
- Pre-college summer programs
- Faculty involvement
- Commitment of administration/faculty to program
- Adequate financial aid/scholarships
- Merit awards
- Recognition banquets and awards
- Reduced course loads when appropriate
- Academic year programs for high school students
- Diagnostic testing/effective placement procedures
- Effective first-year curriculum
- Effective recruiting/admissions policies to increase overall minority enrollment
- Minority professional engineers as role models
- Extensive personal contact with students by faculty and program staff.

SOURCE: Landis, Raymond B. (1985). Handbook on Improving the Retention and Graduation of Minorities in Engineering. New York, NY: The National Action Council for Minorities in Engineering.

The second model is supplied by the Retention Task Force of the Committee on Minorities in Engineering (Landis, 1985). Developed in 1977, this model focuses on minority students in engineering, thus providing a focused view that related to the populations involved herein. In this model (See Table 4), the Task Force suggests the implementation of solid pre-testing, placement, advising, and tutoring programs and strategies to assist the first-year student. Career guidance, work experience, summer programs, and an effective first-year curriculum would support students in the transition year from high school. In addition, the Task Force also notes the importance of faculty/administration involvement and commitment to the retention effort. Personal contact with students as support agents and role models are important contributors to student retention. Recognition banquets and merit awards for both students and faculty should be established to reinforce the effort. This model is inclusive of many of the key ingredients of solid institutional retention programs discussed previously, and also regards them in a rank-ordered fashion in terms of importance.

Principles of Effective Retention Programs

"It's impossible to really innovate unless you can deal with all aspects of a problem. If you can only deal with yolks or whites, it's pretty hard to make an omelette' (Quote of Gene Amdahl, President of Amdahl corporation, Levitz & Noel, 1985, p. 351).

The above philosophy is key to any success that a retention program may have at any university. The look at the "big picture" is an important need as suggested by much of the literature. Martin (1985) suggests that too many schools have focused on admission exercises and recruitment programs instead of focusing resources on an institution-wide program to reduce attrition. In order to put things in the right perspective, Astin (1994) states that educators must do two things: (1) look at issues from a system perspective rather than an institutional perspective; and (2) view educational institutions in the same light as other public services providers, such as hospitals and clinics. Astin's point is that higher education must start looking at the "big picture" and anticipate the needs of society as a whole and match that with the needs of the student.

Tinto (1993) developed three principles of an effective retention program. First and foremost is that any program must be committed to the students that they serve. The focus of program attention should be to the targeted population, and not to other factors that may cause the direction of the program to go "out of focus." Second, an effective retention program must be committed to the education of all students, and not just some. Thus, a retention program, while it may incorporate special interventions for special populations, must address the needs of all students in order for the institution to meet its mission of providing quality education to all. Third, Tinto states that an effective retention program must be committed to the development of supportive social and educational communities on campus. Again, ensuring the social and academic integration of students is, according to Tinto, the most important issue to contend with in terms of student persistence.

Important Organizational Considerations in Developing an Institution-Wide Retention Program

The development of any program at any university requires a multi-faceted process incorporating all individuals involved. In terms of an institution-wide project, the advice of Flannery et al. (1973) must be remembered: that the entire institution must take part. From an institutional point of view, there are many things that must happen on campus to ensure that positive change can take place. Several researchers have identified their "lists" of appropriate actions. Included here is a brief discussion of the lists that are appropriate to this discussion.

Clewell and Ficklen (1986), in their examination of effective institutional practices at four-year institutions, identified the following characteristics which each of the institutions employing effective practice shared:

(a) the presence of a stated policy;
(b) High level of institutional commitment;
(c) Institutionalization of the program;
(d) Comprehensive services, dedicated staff, and strong faculty support;
(e) Atmosphere that loors students to participate without feeling stigmatized; and
(f) Collection of data to monitor student progress.

Institutional focus is the key ingredient of the above set of characteristics. Stated policy, institutional commitment, comprehensive service, supportive atmosphere, and the ability to assess progress all point to the importance of a collected vision and ownership on the part of the entire campus, including administration, faculty, staff, and especially students. As will be discussed, leadership and faculty ownership are key variables in a successful equation, and the message that is sent down from the top is critical to the support from underneath.

Table 5. Organisational Steps of the Headway Model for Minority Medical Student Retention, Ohio University College of Osteopathic Medicine

- Define a need: Describe the problem and suggest the need for a program
- Describe a population: Describe which population(s) should be served
- Demonstrate the need: Convince the administration to address the needs of the population through this program.
- Assess existing resources: Analyze the existing sources, especially human resources, for potential assistance with the program.
- Explore funding sources: Determine the accessibility of outside grants and the feasibility of internal funding.
- Identify goals and roles: Determine goals and roles for the individual teams that will make up the program (e.g. English department).
- Develop systems to monitor students: Develop a comprehensive information sheet to monitor student achievement.
- Plan and implement systems for intervention: Ensure that the referral service is appropriate and meeting the needs of the students.
- Evaluate and adapt the program: Solicit quarterly evaluations for the team and make appropriate changes. (Cooper et al., 1992)

Cooper, Williams, and Burnett (1992) developed a retention program at the Ohio University College of Osteopathic Medicine directed at minority students. In an attempt to create a replicable model, the authors developed a step-by-step analysis of the program development process (See Table 5). The first part of the Cooper model is focused on identifying the need and providing a rationale for the program. Secondly, the assessment of available resources and possible support funding is conducted. Third is the identification of the roles and responsibilities of the involved parties. At this point, the shift of the program goes from planning to implementation. The development and implementation of monitoring systems and intervention activities become the core of the program, while the evaluation instrumentation and process acts as the quality control instrument for the entire project. This model looks at the project from a typical "grant perspective." That is, it describes the project in terms of how an external group would view it in terms of acknowledging the need and supplying support.

A very useful set of action principles for implementation of a retention program are offered by Tinto (1993: See Table 6). As has been established by other models, the importance of assessment, ownership, collaboration, institution-wide coverage, and commitment are essential to Tinto's principles. In addition, the development of appropriate skills by the faculty and staff is acknowledge, as well as the principle of frontloading the program for freshman students.

Table 6. Tinto's Seven Action Principles of Successful Implementation

1. Institutions should provide resources for program development and incentives for program participation that reach out to faculty and staff alike.
2. Institutions should commit themselves to a long-term process of program development.
3. Institutions should place ownership for institutional change in the hands of those across the campus who have to implement that change.
4. Institutional actions should be coordinated in a collaborative fashion to insure a systematic, campus-wide approach to student retention.
5. Institutions should act to insure that faculty and staff possess the skills needed to assist and educate their students.
6. Institutions should frontload their efforts on behalf of student retention.
7. Institutions and programs should continually assess their actions with an eye toward improvement. (Tinto, 1993)

The issue of institution-wide change and the coordination of effort across all departments and levels is essential to real change. However, as Kanter (1983) notes, any change at the institutional or individual level is a complex phenomenon. In describing the interdependent nature of campus change, Smith, Lippett, and Sprandel (1985) discuss the organizational nature of the college institution. In their discussion, the authors describe a set of four interdependent parts of the higher education structure which must interact in order to support change. First is a vertical set of relations between the system levels. The strata of higher education includes such levels as the

Trustee level, administrative level, and faculty level. Second is a set of horizontal relations between departments, administrations, student organizations, and others. The third part is the elements of the past, present, and future. Smith et al. claim that the tradition of the past, the practice of the present, and the goals and perspectives of the future all must be dealt with. Finally, the relation of the system and the environment, including political, physical, and economic, provides the final interdependent component.

Table 7. Noel's Steps for Increasing Student Retention in Higher Education

a. Establish an institution wide retention steering committee
b. Determine the dropout rate
c. Conduct a dropout study to determine why students are leaving
d. Conduct an institutional self-study to determine where the institution is successful and where it needs improvement
e. Establish retention task committees within each of the unites or departments to determine appropriate student-oriented action programs
f. Make concerted efforts to increase faculty and staff awareness of factors related to retaining students; encourage a campus-wide attitude of servicing students
g. Build a sound marketing approach into the recruiting program; recruit for retention
h. Develop a good orientation program for entering freshmen and transfer students
i. Build a student counseling and advising program from admissions through job placement
j. Provide a special career- planning program for students who are undecided about educational major or vocational choice
k. Provide a range of academic-support services for students with marginal academic credentials (every college has a bottom quarter of its entering freshman class)
l. Build a so-called early warning system to identify students who are likely to drop out
m. Set up a simple but sensitive exit-interview process
n. Institute a tangible reward system for good teaching and faculty advising.

SOURCE: Noel, Levitze, Saluri and Associates (1985). Increasing Student Retention. San Francisco, CA: Jossey-Bass, Inc.

The pursuit of institutional change, according to Smith et al. (1985), is dependent upon the ability of those leading the change to orchestrate all of the parts described above, a process which often takes too much of the project energy. These different interdependent parts of the organization are barriers to change. In addition, they also become barriers to communications: communications between colleagues and levels.

Regardless of the structure of institutional change, Smith et al. (1985) also acknowledge the process of change. In particular, the four levels of readiness that must be ascended in order to produce desired results, and must involve each of the four parts already acknowledged. Level one is a stage of *latency*. As suggested, there is no action at this point, and no leadership or sanction. Not until the institution has reached Level Two, the *Awareness* level, is there much acknowledgment of the project. At this level, the need for system-wide action is realized, and Smith et al. note that this rarely happens without the input of either an outside or inside consultant. Level Three is the *Intent to Act* stage. Leadership lends its support publicly at this point, sending out supportive and formal messages. Finally, Level Four is the *Energy* stage, where the project is put into action.

The four levels just described set the stage for campus involvement, as well as interpret the timing of campus leader involvement. The next section of roles will describe the importance of leadership in any campus change.

Before that discussion, however, one more model should be mentioned. Noel (1978) developed a set of institutional actions that need to be enacted to produce an increase in student persistence in higher education(See Table 7). This model provides institutions a map of actions to pursue in the development of a retention program.

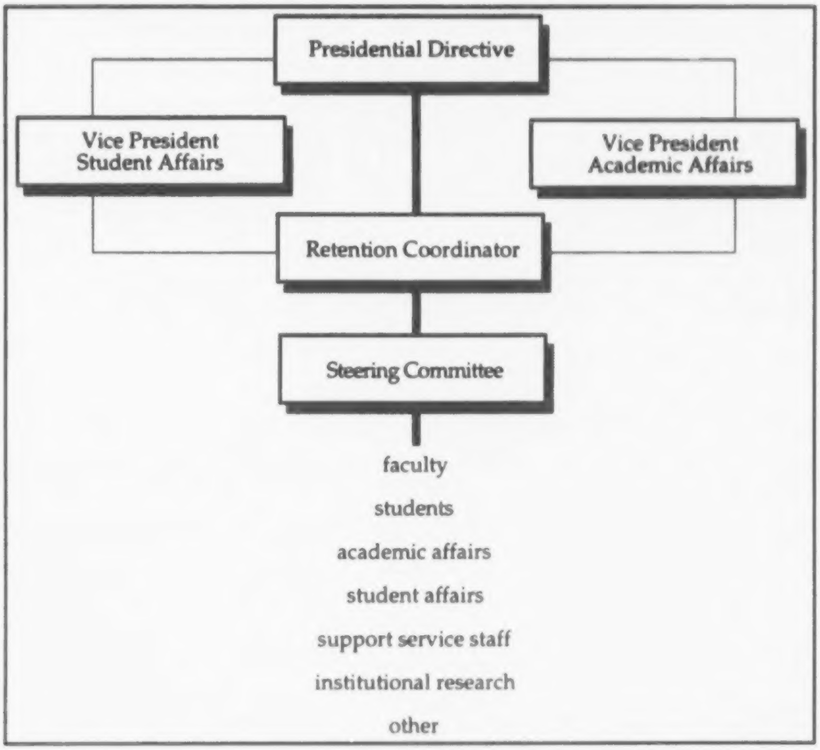
Role of the Key Players

The role of campus officials and faculty is an important part of any retention program. The expected behaviors and involvement to be followed must be communicated in order to meet the needs of any implementation strategy.

Beal and Noel (1980) developed a organizational chart which they consider to be the most effective design to support the implementation and development of a retention program (See Figure 5). The chart illustrates the key figures in the college hierarchy and the flow of authority and leadership. At the top end of the chart is the presidential directive. The rationale to the directive, as Beal and Noel claim, is the "greatest need" concept. A directive from the top shows that the effort is being supported by the administration, especially when the directive is passed through the vice presidential offices, in this case, the offices of student and academic affairs. Identifying a retention coordinator is an important part of project direction and acceptance. The establishment of a permanent position also sends a message to the faculty and staff as to the importance of the program. A directive sent down without the financial or organizational support generally sends a message to those further down the hierarchy that this is not an important goal of the administration and therefore is not to be taken seriously. The commitment of the university to orchestrate change through a retention coordinator is an essential step.

Beal and Noel (1980) also acknowledge the importance of a steering committee to be "charged with the responsibility of giving ongoing direction to the analysis of attrition/retention on the campus and to the formulation of intervention strategies" (p. 91). Important to the success of this direction is the inclusion of the various campus constituencies, including departments, faculty, and students. Going back to Smith et al.'s (1985) discussion of four interdependent parts of the college campus, each of these parts would have to be represented in order to ensure that the entire campus constituency "buys in" to the program. At the bottom (but no less important) end of the hierarchy are the remaining constituents of the college campus: faculty, staff, students, executive departments, and others.

Figure 5. Beal & Noel's All-Campus Student Retention Effort


Presidential Directive
Vice President Student Affairs
Vice President Academic Affairs
Retention Coordinator
Steering Committee
faculty
students
academic affairs
student affairs
support service staff
institutional research
other

The Role of Campus Leadership

Leadership is a crucial role of any institutional change, whether that leadership stems from the president's office, the dean, or the director of retention. As was just illustrated through the Beal and Noel model (1980), the presidential directive is an important feature in creating the atmosphere for change through a clear message of direction and support. Gone is the top-down decision-making process of the 70s, and in are the cooperative organizational styles that management philosophies such as Total Quality Management (TQM) are about.

The TQM philosophy just mentioned, while it has its supporters and detractors, has established a new way of looking at management and leadership. TQM is based on the concept of continual improvement of product and service. With regard to higher education as a service agency (Astin, 1994), the new role of leadership in terms of TQM is to remove the barriers that prevent people from conducting and improving their service (Chaffee and Sherr, 1992; Justiz, 1994). The Leadership must pave the way for any improvement through goal specification and clarification and the elimination of obstacles, especially when dealing with an institution-wide change. When the change process comes from the bottom up, however, the leadership must be in a position that they can identify this grass-roots support and provide appropriate support and guidance (Smith et al., 1985). However, it is important to stress the cooperative approach in any managerial style. Cooperation and a shared vision based on a foundation of shared experience and values is pivotal to real change on a post-secondary campus (Wolverton and Richardson, 1992). Research also suggests that leadership must also address the issue of adequate resources for change, including the positioning of a full-time director of retention (Beal and Noel, 1980; Schexnider, 1992). Again, this assignment will send out a message of institutionalization and legitimacy to all faculty and staff.

Wolverton and Richardson (1992), in their Ford Foundation study regarding faculty behaviors and student success, emphasized the important role of campus leadership and issued the following recommendations:

- Empower others by clarifying values and providing the vision that guides organizational behavior.
- Share the vision and its meaning for the organization with others through clear communication, which includes a willingness to listen
- Build seeds of understanding, identity and commitment into the very processes which create organizational strategies.
- Model the behavior he/she wants to see by building trust, through honesty and integrity, and confidence through respect.

- Set high expectations for him/herself and for those around him. That is, expect good performance, recognize and reward excellence, and balance desires for individual achievement with the cooperative effort of all.
- Create an atmosphere that encourages risk-taking and recognize mistakes and failures as pathways to success.
- Search for synergies that not only add value but multiple it
- Provide faculty, staff and administrators with the tools needed for self-leadership through professional development, training and education, and feedback.
- Encourage continuous, incremental improvement and innovation by promoting divergent thinking that is grounded in the interdependence of shared responsibility and authority. (p. 18)

In conclusion, the leadership of the campus must pull the various factions on campus together (Smith et al., 1985) through coalition building and collaborative processes (Chaffee and Sherr; 1992) and through the clear statement of goals and expectations (Wolverton and Richardson, 1992).

The Role of Faculty

In their book, What Works in Student Retention, Beal and Noel (1980) cite Flannery et al. (1973) who state: "It is the instructors who ultimately make the educational system effective and relevant, and they must accept the responsibility of using the resources of the college to help the students" (p. 13). Subscribing to this theory would precipitate the need to give faculty more power or a more defined role in the evolution of a college or university. Ainsworth (1985) regards the faculty role as an important aid to the development of policy and practice on campus:

> They help decide upon the issues and policies of admission, graduation, and curriculum. They are in a position to influence policy regarding the establishment of auxiliary programs, the solicitation of industry contributions, and the management of project grants. They can provide connections to higher administration and can significantly contribute to the success or failure of a program through their advocacy or hostility. (p. 105).

But how do faculty fill their role as defined by both Ainsworth and Flannery et al.? Perhaps the influential role of faculty occurs through their instruction, participation on campus committees, and deliberations in departmental meetings. However, to make the faculty feel a part of any campus effort to deal with attrition, Toy (1985) suggests that three fundamental points must be clarified by the leadership. First, the faculty must be convinced that attrition is a serious problem on campus and that change must occur. Second, faculty must also be convinced that their participation is pivotal to the success of any retention effort. And third, the faculty must also be able to identify institutional and administrative support from above, and not be stranded with the prospect of trying to evoke change when it is not a legitimate priority of the administration, or the upper levels of the vertical hierarchy (Smith et al., 1985). These ideals are important, as Beal and Noel (1980) concluded in their study of 944 campuses incorporating a retention project. Twenty percent of campuses surveyed described lack of faculty support as a key barrier to any successful retention effort.

The overall role of the faculty in a retention program, however, is the role as mentor, adviser, and friend (Toy, 1985; Pantages and Creedon, 1978; Beal and Noel, 1980; Astin, 1977). The development of student/faculty interaction is deemed as the most important strategy in creating the social and academic integration theorized by Tinto (1975) and others. As Toy exclaims, "The importance of first impressions supports the contention of Pantages and Creedon (1978, pp. 95-96) that we need to find new ways to maximize faculty-student interaction during the freshman year, including greater faculty involvement in the orientation program and more care in the assignment of faculty advisers" (p. 384). However, Toy also is quick to note that faculty are rarely given time to incorporate these activities into their already busy schedules. Toy contents that if the college is serious about its retention efforts, they must illustrate this importance by establishing a revised reward structure for faculty who take their role seriously as opposed to focusing on the traditional "tenure related" activities, such as research and publishing.

Research Activities and Evaluation

Research is an important role in a retention strategy. Research must be used to identify areas of student need, organize an inventory of current services and programs, and assess the effect of programs, both current and future. The first two areas are critical to the planning of any retention strategy. As Levitz and Noel (1985) advise, "...one cannot get better at what one is doing if one does not know how one is doing" (p. 351). Perhaps this should be noted as the theory of 'ones,' but the point is that the program developers must be fully cognizant of student issues and campus climate in order to either deliver new services or revamp existing services to the benefit of all populations. Levitz and Noel (1985) identify the research process as three separate stages of activity: the analysis of student enrollment behavior, the assessment of student interactions with the environment, and the evaluation of program effectiveness. However, Levitz and Noel's research phases only incorporate on-campus deliberations between student and the institutional climate. A more fundamentally useful process would include knowledge of student attributes before matriculation (Tinto, 1993; Armstrong-West and de la Teja, 1988). This knowledge would allow administrators and retention designers to formulate programs based on the perceived needs of the student body. In terms of TQM, this would result in a focused direction toward a continual improvement in the campus environment. Hale (1991) supports this concept, suggesting that the inventory of campus culture and environment be built around the identification of perceived problems and barriers to success for the entire campus population.

Table 8 outlines Levitz and Noel's (1985) list of objectives of a comprehensive retention research program. The baseline philosophy behind this set of objectives is the emphasis on student-centered and program-centered research.

Table 8. Levits and Noel's Objectives of a Comprehensive Retention Research Program (1985)

1. To study success—to find out what the institution is doing well in order that it may do more of it.
2. To pinpoint campus services that need further attention so that they may become the type of student resources of which the institution can be proud.
3. To determine the type of intervention programs and practices that are linked to student success and student persistence.
4. To follow those students who receive special attention or participate in special programs to determine whether the intervention is having the desired impact.
5. To target students who will benefit from interventions known to have a positive impact.
6. To provide validation of the outcomes the institution is striving to achieve.

Levitz & Noel (1985). p. 350.

The Ohio University College of Osteopathic Medicine's retention project (Cooper et al., 1992) identified specific data sets which became the research base for their project (Table 9). This table gives precise actions for either the institutional research department or the research office of the retention project to undertake in order to assess the need and evaluate the effectiveness of the program.

Table 9. Ohio University College of Osteopathic Medicine Strategies for Evaluating Excellence

1. Student scores on standardized examinations of locally constructed examinations
2. Performance of graduates in graduate school
3. Pre- and post-testing of students;
4. Achievement in general education;
5. Performance of graduates of professional programs on licensure examinations;
6. Placement of graduates of occupational programs in positions related to their fields of preparation;
7. Financial soundness and stability;
8. Adequacy and use of institutional resources (assets);
9. Rate of job placement for graduates; and
10. Rate and quality of placement in graduate or professional education. (p. 3)

Source: Cooper, N.L., Williams, S.Y., and Burnett, P.A. (1992). Headway: A multi-disciplinary approach to retain black students in an osteopathic medical school. In Lang and Ford's (Eds.) Strategies for retaining minority students in higher education. Springfield, IL: Charles Thomas, Publisher, pp. 108-121.

Chapter Summary

The literature review has uncovered an enormous amount of information regarding factors related to student attrition, retention programs, and organizational factors related to campus change. Because of the mass of information produced in this chapter, it is important to summarize the key issues presented within.

PART I: FACTORS RELATED TO RETENTION

As expressed in Part I, there are dozens of factors which contribute to a student's decision or ability to persist at college. A review of significant research resulted in the identification of five key areas which are believed to impose the greatest force of this decision-making process. The **academic preparation** of students is a key impediment to long-term college success and retention. In particular, Moore and Carpenter (1985) suggested that between 30 and 40 percent of students are underprepared for their freshman year. Socio-economics, poor learning environments, and the social-stigma attached to women and minority groups regarding ability and place in society have become major barriers to students' development of academic tools and motivation to pursue post-secondary education and science-based careers. The selection of appropriate college-preparatory courses and prerequisites is also an important consideration for students before college.

The **climate and culture** of a campus is a prerequisite to student success, both academically and socially. Historically Black Colleges and Universities have been found to offer a more congenial atmosphere for minority students compared to the often hostile and isolated environment offered to minority students at predominantly white institutions. However, transition from high school (or work force) into college is quite often a difficult time for students of all races or ethnic backgrounds, regardless of institution type. The opportunity for social integration, on-campus housing, and adequate social support services are all key elements of a positive campus culture.

The student's **goal and institutional commitment** is a large determinant in the persistence of a student. Tinto (1993) claims that the personal commitment to an academic or career goal is the most important factor related to student persistence. As well, the institution's ability to assess the student's commitment and match with the mission of the college is a key element to the success of the student.

The level of **social and academic integration** into the college environment is also strongly related to retention. Spady (1970) and Tinto (1975) utilized Durkheim's theory of suicide to develop a theory which suggests that the isolation of students within the social fabric of an institution is a key factor in their departure. The campus climate and goal commitment are important considerations in determining the "fit" between the student and the institution, and the level of academic and social integration of the student must be a major concern for college administrators and faculty.

Finally, the last major factor identified was the issue of finance. Although the research on the effect of **financial aid** on students is equivocal, several studies have suggested that the lack of or difficulty in attaining financial support is a major barrier perceived by minority students, especially African American students. Even when aid is available, the type of aid package offered can have various affects on persistence. For instance, studies have shown that grants typically increase the ability of students to persist, while loans have no significant positive or negative effect. Other forms of aid, including work studies and internships, have also been found to support student retention when students work on or close to campus, work with faculty members, and work within their discipline.

PART II: PROGRAM STRATEGIES AND COMPONENTS

Five areas were identified in the literature which appear to be important considerations for institutional focus regarding the development of campus-wide retention efforts. Although separate and isolated efforts may have a positive effect on student retention, only through the holistic incorporation of all five areas described in the literature review can support the improvement of campus-wide student retention.

Academic and social interventions developed by the college can help ameliorate many of the issues that were described in Part I. The use of counseling (academic, career, social, and financial) services to support the needs of the student body can help guide and direct students, especially during the freshman year. **Tutoring and mentoring programs** have been found to be extremely beneficial in the academic and social development of the student. Peer tutoring and the use of support groups are excellent methods of supporting the academic needs of the student while also developing the social side of college life. **Pre-freshman orientation programs**, when conducted in an appropriate and meaningful way, can help students bridge the gap between high school and college, or even between work and college, whichever is the case. Orienting students to the services available on campus can comfort students and supply them with information that may be important to them during their college experience. Finally, **social support services**, such as extracurricular activities, may provide students with the opportunity to become a part of the social fabric of the university.

The delivery of programs described above may occur through a number of interventions and activities. **Pre-college programs** can provide students at the high school, middle school, and even elementary school ages with the academic preparation necessary for college, while also providing the necessary motivation that many young students are missing during their pre-college years. In addition, pre-college programs also allow institutions an opportunity to track (monitor) students on their path towards college. **Summer bridge programs** are excellent opportunities for the institution to assist students who are enrolled in the following academic year at the college. These programs are usually academically oriented, but also orient the student to the campus before the fall schedule begins. **Freshman year programs** are held during the academic year and focus on the development of the freshman student. Academic, social, and extended orientation programs are often the major focuses of this type of delivery. Finally, **mainstream support programs** offer ongoing academic and social service to students throughout their college experience.

The recruitment and admission policies of an institution often defines the campus culture and atmosphere. At the recruitment stage, the institution has the opportunity to assess the "fit" between the student's goals and the institution mission. By accurately recruiting and admitting students who do fit the institutional mission, the college has a much better chance of serving the student well. In order to do this, colleges must consider the type of student they wish to attract and how to best market their programs to that population. In addition, the college must assess their current use of evaluation criteria, such as standardized tests and other techniques. Recent literature suggests that the use of non-cognitive instruments, such as portfolios and interviews, are more conducive to identifying students for success.

The revitalization and revision of the **curriculum and instructional techniques** was identified as an important component related to student persistence and progress. Science, engineering, and mathematics courses have been notorious for their inability to develop appropriate connections between theory and practice. High rates of course drops in the gatekeeper courses suggest that current approaches to instruction is not meeting the needs nor learning strategies of students. Recent developments have seen the use of instructional techniques more attune to K-12 courses than in higher education, with more widespread use of learning cycles, group strategies, hands-on activities, and research projects. Each of these learning strategies have been shown to improve the capabilities and persistence of students in the sciences.

One other important strategy that was identified through the review process was the need to **monitor student progress**. Although many colleges review records of students on a periodic basis, today's college must develop a student monitoring system that is much more sophisticated than those in use at most institutions. The advantages of monitoring students using both qualitative and quantitative techniques on a consistent timeframe can support the development of an early warning system while also acting as a constant 'quality control inspection' during a student's college career.

PART III: PROGRAM DEVELOPMENT AND IMPLEMENTATION

Factors including the institutionalization, organizational considerations, roles of program stakeholders, and program evaluation and monitoring were identified through the literature as important considerations in the effective development and implementation of a campus-wide retention program.

Much of the literature supported the sentiment that an effective retention program must be **institutionalized**. That is, it must become a regular part of campus service. Institutionalized programs must not be reliant on 'soft' moneys (e.g., grants) to operate, and should support the practices and mission of the college.

The literature also suggests that **inclusion** of the entire campus in the development of the program is important to the eventual effectiveness of the program. Organizational strategies to develop this involvement is perhaps the most important piece of the developmental process. The proper distribution of top-down and grass-roots development and support is essential to the continued development and acceptance of change. Although top-down management practices have been found to be largely ineffective, the need for a clear message from the administration to faculty and staff regarding the importance of the retention program is required to illustrate the administrative support for the program.

Researchers tend to agree that the various stakeholders have much different **roles** in the development and implementation of a retention program. The role of campus leadership is to create the atmosphere for change and support the needs of those involved in the development and implementation of the program. The ability of campus leadership to empower others, create a vision that extends to all corners of the institution, and develop the coalition between factions on campus are important roles for administration. The faculty, however, has the most important role, for they often become the agent through which policies and programs are implemented on campus. Without the support and assistance of this group, there is little hope for the successful implementation of any program on campus. More importantly, the faculty play a direct role in many of the interventions that have been identified in the literature. Role modeling and mentoring, faculty/student interaction, and classroom/lab instruction are areas which require supportive faculty involvement. Thus, an effective organizational plan will offer much power and authority to the faculty.

Finally, the **monitoring and evaluation** of a retention plan is imperative to its success. Developers and researchers who are given the opportunity to design an assessment system to gauge the effectiveness of program components and implementation strategies before implementation have a better chance of creating a system which will accurately depict the true essence of implementation and program effectiveness. The development of this system or strategy will provide the necessary feedback to improve programs and alter directions dependent upon the data collected.

CHAPTER THREE

RESEARCH METHODOLOGY

The methodological portion of this study involved the use of a modified Delphi technique. The Delphi is a research method drawing information in the form of analysis and description from experts in relevant fields. For this particular project, the Delphi utilized the expertise of higher education experts from around the nation to comment and validate a retention framework designed specifically for this study.

The Delphi process required a two-phase research process: the development of the initial framework and the incorporation of the Delphi technique. The remainder of this chapter describes in detail these two phases.

Phase One: Framework Development

The development of an initial retention framework was conducted by the researcher with the support of an extensive literature review. The information identified from the literature review was analyzed by the researcher based on several criteria. First, in the case of research intensive studies, an analysis of the research validity was conducted by the researcher to determine their internal and external validity. The researcher reviewed sample sizes, uniqueness of sample, and the methodology used to analyze the data to determine the validity of the research studies. Because the studies were incongruent in terms of their scope and type, studies were not compared per se, but rather, individually scrutinized using the above criteria. In addition to research studies, the researcher relied on previously conducted literature reviews by experts in the particular fields being studied. In the case of information gleaned from these reviews, the researcher verified findings through the original studies whenever possible. Although the use of a meta-analysis was at first considered, further research of methodological approaches for this study found that a meta-analysis would be unfeasible for a variety of reasons (Pascarella and Terenzini, 1991). First, the diversity of dependent and independent variables across the literature makes the use of meta-analytical techniques difficult to administer in a way that promotes the validity of the final analysis. Secondly, as Pascarella and Terenzini state, "meta-analytical techniques have come under close and often critical scrutiny in terms of their producing a truly objective and meaningful synthesis of evidence" (p. 84). Thus, the decision of how to review the broad spectrum of available research studies is based on those authors' interpretation of the problems related to such an intensive review. Therefore, this study also relied on a narrative explanatory synthesis as the primary method of assessing the literature, and assessed the overall outcomes of the research through the "weight of evidence" of the aggregate research (p. 84). The process of sorting and assessing the collected information was made easier through the use of matrix analytical techniques, such as those described by Smith (1980), Campbell (1983), and Miles and Huberman (1984) (cited by Patton, 1990). The availability of previously conducted literature reviews by experts on student retention, such as Tinto (1975), Pantages and Creedon (1978), and Beal and Noel (1980), further supported the review process.

In regard to this study, two separate parts of the framework were developed to cover issues of retention program content and development and implementation. Based upon the literature review, a content framework was developed which identified key strategies related to financial aid, student services, academic services, recruitment and admissions, and curriculum and instruction. Under each of these components, several categories were identified from the literature, as was appropriate to cover the breadth of the component. To further delineate the retention program content, specific objectives were developed for each category. The result of this process was a five-part content framework covering the components defined above (See Appendix C). In all, 20 categories were defined for the 5 components, from which 80 specific objectives were developed. This became the major component (Part II) of the first-round instrument.

The second part of the framework related to the development and implementation of the program. As described in Chapter I, the format followed this outline:

a) Pre-Planning Stage
b) Planning Stage
c) Implementation Stage
d) Monitoring Stage

Based upon the literature review, the researcher developed criteria for each stage identified above. The result was a set of four lists which outlined necessary considerations for administrators and faculty members in regard to the development and implementation of a student retention program. This data was utilized for Part III of the first-round instrument.

Phase Two: The Delphi Process

The validation of the model generated in the first phase of the study was conducted through the use of the Delphi technique. The following section provides a brief background and description of the Delphi process employed.

BACKGROUND

The Delphi technique, developed in the 1950s by the Rand Corporation, involves the surveying of experts in the field of study relevant to the research study (Skutsch and Hall, 1973; Whaley, 1987). Named after an ancient site in Greece, Greek mythology helped Delphi attain a status of wisdom and knowledge, and through this status grew the development of the richest cultural center in ancient times. Thus, the Delphi technique was named after this region to describe the type of knowledge that the Delphi approach attempts to gain: expert opinion based upon consensus.

Most Delphi designs are used to create future scenarios and future forecasting, but they have also been used to identify focus areas in the development of strategic plans for corporations and institutions, the establishment of goals, aims, and objectives for educational institutions, hiring of officials, and curriculum planning (Skutsch and Hall, 1973; Whaley, 1987). In particular, the Delphi technique is often employed to combat potential conflict among a particular group.

The Delphi often succeeds where other techniques fail (Skutsch and Hall, 1973). Many topics or issues in which conflict or indecision is expected are particularly well served by the Delphi technique. Skutsch and Hall identified three main advantages to using the Delphi technique. First, group judgments are superior to individual judgments. The reliance on the "pooling" of information and resources among team members supports the notion that the whole is greater than the sum of its parts. The synergy that evolves from the Delphi process is expected to create a strong sense of purpose among the participants and a more reliable product. Secondly, the factor of anonymity among the participants protects them from the threat of group disparagement and retribution from others within the field. Regardless of political correct beliefs and theories, participants are free to reveal their true beliefs in relation to the Delphi questions. The third principle identified by the authors is that of group pressure. The Delphi technique tends to consolidate group opinion to produce one clear statement or statements. The consensus-driven aspect of the Delphi requires that individual participants succumb to an "unspoken group pressure" to conform (p. 7).

The use of the Delphi technique requires that three specific steps be conducted by the researcher. First is the development of the research instrument. As described above, the Delphi approach may be used to respond to a variety of issues or needs.

Therefore, the actual instrument used in the process is extremely flexible in its design. Although the Delphi may use forced-answer questions, the power of the Delphi resides in its open-ended nature, such that respondents may include their thoughts and beliefs in regard to any question or discussion. As in scenario developments, Delphis are most noted for their ability to incorporate the opinions of several experts into one consensual product. The analysis of the instrument may allow for quantitative techniques, but the support of qualitative analysis is the strong suit of the Delphi.

The second step of a Delphi study is the selection of the Delphi panel. This panel usually consists of approximately 10 to 30 experts in the field of study. The advantage of using a large panel is the broad view that may be cast regarding a certain subject. However, a larger panel makes it more difficult to reach consensus regarding a subject, which is one of the main goals of a Delphi study. Therefore, the researcher must carefully assess the potential panelists and decide on the size of the panel relative to the scope and timeline of the study.

The third component of the Delphi process is the dissemination, administration, and collection of the research instrument to the expert panel. This process is referred to as a Delphi "round." It is usually repeated two to four times during the research process. Upon collection of the instrument after the first round, the researcher analyses the data and revises the framework to incorporate the responses of the participants. This process results in the fine-tuning of the framework and is aimed at bringing the scope of discussion toward group consensus. When the revised instrument is redistributed to the panel, participants are given the opportunity to review peer responses from the previous round, albeit in an anonymous fashion (Anonymity is important in a Delphi study, as it allows panelists to respond without fear of retribution from their peers). Panelists can then make further comments and alterations to their original responses. The Delphi process is concluded when consensus has been achieved regarding the initial goals of the study. In the event that respondents are forced to answer questions outside their realm of expertise, panel members are encouraged to "join in with the consensual or prevailing opinion (Skutsch and Hall, 1973, p. 4). The great advantage of the Delphi technique is that through this consensus-building process, ideas and philosophies contained in the original model can be modified to more accurately reflect the current atmosphere of expertise.

Use of the Delphi Technique Within this Study

In terms of this study, the research methodology required several steps to prepare and administer the Delphi process, including the identification and selection of the Delphi panel, the preparation of the research instrument to be distributed to the panel, the dissemination and collection of the material, and the analysis of data from the Delphi panel.

IDENTIFICATION OF DELPHI PANEL

The Delphi panel was identified and selected through two methods: (a) review of the literature; and (b) suggestion from experts within the field.

Experts were identified from a broad scope of education across the country, including educational researchers and practitioners who have enjoyed success in a wide practice or through publications. In addition, it was decided that the panel should also represent that various ethnic, racial, and gender groups that make up the university populations. The first round of panel identification resulted in a list of 30 potential panelists. Discussion with his advisor and other researchers led the researcher to believe that a panel of approximately 12 expert participants would be best for the study. The rationale for this number was to incorporate enough expert testimony and feedback to produce a meaningful and useful outcome for the study, while limiting the panel to 12 also allowed the researcher to analyze the data in a reasonable fashion. It was felt that too many more panelists would make any consensus difficult.

In the end, 16 panelists were included as part of the Delphi panel. The number steadily grew from 12, mostly due to the urging of panelists to include persons who they felt would strongly add to the study. Of the 16 panelists, the researcher was responsible for identifying and contacting 10, while the remaining 6 panelists were identified by Mr. Bernard Charles, an associate of the researcher and a well-respected practitioner and policy-maker in higher education.

The composition of the Delphi panel was deliberately designed to incorporate for the many nuances of higher educational reform and for the specific expertise of student retention, college teaching, science-based study, and policy development. Five of the panelists currently hold positions where educational research is their primary responsibility. The other panelists may be more accurately described as practitioners due to the type of work that they conduct. Ten of the 16 panelists were men, and the racial/ethnic composition of the panel is distributed as follows: 8 African American, 3 White, 3 Hispanic, 2 Native American. The panel participants and a brief description of their experience is detailed in Table 10.

Table 10. Delphi Panel Participants

Arrington, Pamela **Director, National Retention Project, AASCU, Washington, DC**

Dr. Arrington is Director of the AASCU/Sallie Mae National Retention Project. In operation since 1991, the National Retention Project's main goal is to help state colleges and universities in the pursuit of improving student retention. Previously, Dr. Arrington was professor in the Human Resource Development Program at Bowie State University.

Blackburn, Ronald **President, ASPIRA, Washington, DC**

Dr. Blackburn has held the post of president of ASPIRA since 1994. Responsibilities include serving as national spokesperson for the organization as well as providing leadership and management services. Previous professional experience includes service as Coordinator of Student Academic Enrichment for The College Board's EQUITY 2000 program and Special Assistant to the President of the Ana G. Mendez University System in Puerto Rico.

Charles, Bernard **Senior Executive, The McKenzie Group, Washington, DC**

Mr. Charles current serves as a Senior Executive for The McKenzie Group, Inc., in Washington, D.C. Chief responsibilities include the management of two NSF-funded projects: The Model Institutions for Excellence program and the Urban Systemic Initiative. Previously, Mr. Charles held positions as Senior Vice President of the Quality Education for

Minorities (QEM) network in Washington and Senior Vice Program Officer of the Carnegie Corporation of New York.

Ford, Clinita **Director, National Higher Education Conference on Black Student Retention, Tallahassee, FL**

Dr. Ford is the Founder and Director of the National Higher Education Conferences on Black Student Retention, sponsored annually by Florida A&M University. Dr. Ford received her Ph.D. from Kansas State University in Nutrition and Biochemistry, and is co-editor of the book Strategies for Retaining Minority Students in Higher Education.

Gagnon, Gerald **Vice President, Oglala Lakota College, Martin, SD**

Dr. Gagnon is the Vice President for Instructional Programs for the Oglala Lakota College, based on Martin, South Dakota, and currently serves as one of the principal coordinators for the College's Model Institutions for Excellence grant from NSF. Dr. Gagnon held a visiting professor position at the University of Wisconsin at Madison and received his Ph.D. in History from the University of Maryland.

Hope, Richard **Vice President, Woodrow Wilson Fellowship Foundation, Princeton, NJ**

Responsibilities with WWFF includes the direction of the Woodrow Wilson Program in Public Policy and International Affairs and also oversees higher education programs. Previous experience includes: Executive Director of the Quality Education for Minorities project at MIT, Director of Intercultural Studies Center and Full Professor at Indiana University, and Professor of Sociology at Morgan State University.

Jones, Vinetta **National Director, The College Board's EQUITY 2000 Program, New York, NY, and Washington, DC**

Dr. Jones has held current position since 1990. Main responsibilities include the provision of leadership and direction for EQUITY 2000, which links school districts, universities, and the private sector in an effort to close the gap in college-going and academic success of students in urban school districts nation-wide. Previously served as Dean of the School of Education and Urban Studies at Morgan State University and Director of the MSEN program in North Carolina.

Morrison, Catherine **Director of Research, National Action Council for Minority Engineers (NACME), New York, NY**

Currently serves as Director of Research for NACME in New York. NACME has developed exemplary college programs which have increased the number of minority students who have graduated from engineering programs around the country.

Perkins, James **President, CYS Inc., Jackson, MS**

Dr. Perkins is a former Dean of the School of Science and Technology at Jackson State University in Jackson, Mississippi, and is currently President of CSY, Inc., an educational firm specializing in the development of computerized and digitized instructional systems. The latest development of CSY is the Minorities in Science program, a videodisk-based program which is aimed at motivating minority students toward the pursuit of science careers. Dr. Perkins has also taught Chemistry, Physics, and Algebra at the public school level.

Rendón, Laura **Associate Research Professor, Arizona State University, Phoenix, AZ**

Dr. Rendón is an associate research professor in the Division of Educational Leadership and Policy Studies at Arizona State University, where her research focuses on educational partnerships, higher education, community colleges and cultural diversity in education. She is the author of numerous articles, and is affiliated with the ASU Hispanic Research Center. She is currently a member of the National Board of Directors of the American Association for Higher Education, The National Advisory of the Woodrow Wilson Fellowship Foundation, and the Technical Advisory Board of the Quality Education for Minorities (QEM) Network. Dr. Rendón earned her Ph.D. in higher education from the University of Michigan.

Rhodes, George **Chairman, Department of Educational Administration and Policy in the School of Education, Howard University, Washington, DC**

In his present position, Dr. Rhodes has been actively involved in the study and implementation of a comprehensive student retention program for the predominantly minority student population at Howard University. Dr. Rhodes previous experience has included Director of the Center for Academic Reinforcement at Howard and a 15-year position with the Department of Education in Washington, D.C.

Rodriguez, Carlos **Senior Researcher, Pelavin & Associates, Washington, DC**

Dr. Rodriguez has served as Senior Researcher with Pelavin & Associates in Washington, D.C., for the past two years. Dr. Rodriguez' dissertation, completed in 1993 at The University of Arizona, studied the patterns of minority students in undergraduate science and engineering programs.

Seymour, Elaine **Director, Bureau for Sociological Research, Boulder, CO**

Dr. Seymour is the Director of the Ethnography and Assessment Research Department within the Bureau for Sociological Research at the University of Colorado. Talking About Leaving, an ethnographic study about factors contributing to student departure in science, mathematics, and engineering undergraduate programs, is one of Dr. Seymour's most recent contributions to the understanding of student progress in the sciences. Other experience includes a Fulbright Scholarship at Corpus Christi, Texas, and Evaluation Project Director for Project Kaleidoscope.

Tashiro, Jay **Director, Center for Environmental Sciences, Northern Arizona University, Tempe, AZ**

Dr. Tashiro is currently Director of the Center for Environmental Sciences at Northern Arizona University, and has been an active faculty member at NAU since 1990. Dr. Tashiro was Director of the Institute for the Teaching of Mathematics and Science to the American Adolescent at Simon's Rock College. Consulting experience includes work for the Quality Education for Minorities project, the National Science Foundation, and Project Kaleidoscope. Dr. Tashiro received an A.B. degree in Biology and Chemistry, and a Ph.D. in Ecology and Statistics.

Treisman, Uri **Director, Charles A. Dana Center for Mathematics and Science Education, University of Texas at Austin, Austin, TX**

In addition to serving as Director of the Dana Center, Dr. Treisman is also a professor of Mathematics at UT Austin. Dr. Treisman is well-known academically for his study of Black student achievement in calculus courses at UC Berkeley. This study became the foundation for the Emerging Scholars Program (ESP), which emphasizes the use of peer study groups and other learning practices to enhance student learning. Dr. Treisman currently serves on the Advisory Board of the NSF in addition to a number of other appointments.

Wilson, Reginald **Senior Scholar, American Council on Education, Washington, DC**

Mr. Wilson is a senior scholar at the American Council on Education, where he has previously held the position as Director of the Office of Minority Concerns. In addition to his position as president of Wayne County Community College in Detroit, Mr. Wilson has also co-authored numerous publications and serves on the editorial board of The American Journal of Education and The Urban Review.

PREPARATION OF AND DISSEMINATION OF ROUND ONE

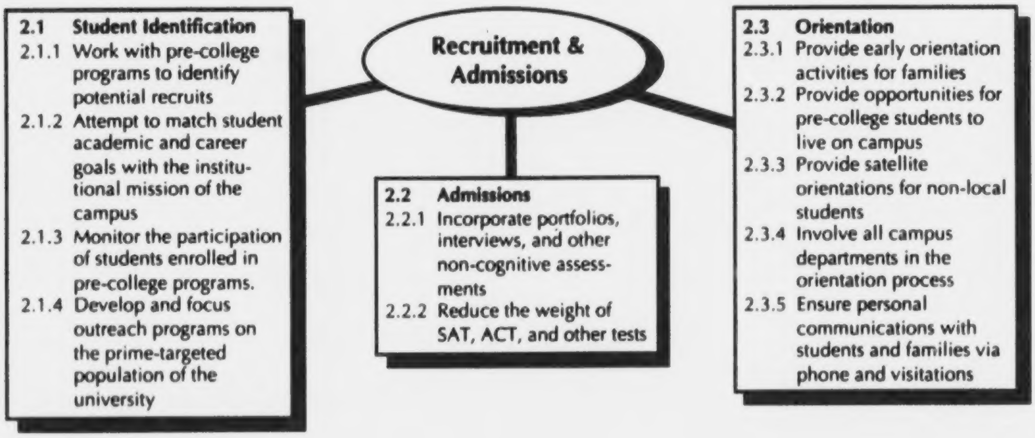
The first-round instrument was developed to incorporate as much detail regarding the framework as possible. However, the researcher had a difficult time trying to balance how much material to pass on to the panelists: enough material to answer the research questions but not too much that would dissuade the panelists from participating. Unfortunately, by the time the conceptual framework was developed, the size of the instrument increased dramatically. The researcher was worried about the impact that an instrument of this size (approximately 40 pages) would have on the response rate. Although it was felt that impact would be largely negative, the researcher decided to risk the longer length of the instrument rather than water down the content of the framework.

The first-round instrument contained five parts covering the framework content and the implementation process. Below is a brief explanation of each component of the instrument, which may also be reviewed in Appendix C at the end of this document.

Part I: Introduction. This component was provided to give the panelists a brief review of the theoretical underpinnings about student retention. In particular, the introduction discussed the impact of academic, social, and institutional components on student retention. Panelists were asked to comment on this four-page section, but it was not considered to be the major focus of the study.

Part II: Institutional Components of Retention. This component introduced the conceptual framework to the panelists. The framework, as described earlier, was divided into five separate components: financial aid, recruitment and admissions, academic services, curriculum and instruction, and student services. Each component was divided up into separate categories (See Figure 6 and Appendix C). For instance, financial aid was divided into four categories, including grants and scholarships, loans, assistantships and work studies, and financial counseling. These categories were then further divided up into specific objectives. Again, an example of an objective for grants and scholarships was "maximize availability of grants and scholarships compared with student loans." Each category had between two and six objectives listed.

Figure 6. Financial Aid Component


Recruitment & Admissions
2.1 Student Identification
2.1.1 Work with pre-college programs to identify potential recruits
2.1.2 Attempt to match student academic and career goals with the institutional mission of the campus
2.1.3 Monitor the participation of students enrolled in pre-college programs.
2.1.4 Develop and focus outreach programs on the prime-targeted population of the university
2.2 Admissions
2.2.1 Incorporate portfolios, interviews, and other non-cognitive assessments
2.2.2 Reduce the weight of SAT, ACT, and other tests
2.3 Orientation
2.3.1 Provide early orientation activities for families
2.3.2 Provide opportunities for pre-college students to live on campus
2.3.3 Provide satellite orientations for non-local students
2.3.4 Involve all campus departments in the orientation process
2.3.5 Ensure personal communications with students and families via phone and visitations

Part II contained both quantitative and qualitative response sections to be completed by each panelist (See Table 11 and Appendix C). The response section, which was divided up by component and category, listed each objective of the model, followed by a brief rationale for its inclusion into the framework. Panelists were then asked to complete a four-point Likert-like scale relating the level of importance for that particular objective. A four-point system was used to make the choices simpler and quicker, especially considering the size of the framework and the 80 objectives listed. An even number of points was used in the instrument to force panelists to make a positive or negative choice regarding each objective. The instructions simply stated that the digit '1' represented a rating of 'Not Important,' while a '4' represented 'Most Important.' No descriptors were given for the two mid-digits. The purpose of the Likert-like scale was to allow the panelists to rate data in rank order. That is, to develop a relative picture of how each objective compared with others. By keeping the number of options low, the instrument was easier to complete, while still collecting data that would allow for comparison during analysis.

Table 11. Excerpt of Part II Response Instrument

2.1	Student Identification		
2.1.1	Work with pre-college programs to identify potential recruits	The pre-college programs developed by colleges are excellent methods of recruiting and monitoring students during their elementary, middle, and high school years.	1 2 3 4
	Comments:		

Please note—the physical proximity of the spaces illustrated in the figure have been changed to fit the parameters of this page. See Appendix C for exact specifications.

In addition to the Likert-like scale, panelists were also given space and encouraged to add specific comments for each objective. Following each category (e.g., grants and scholarships), a space was also added for panelists to add general comments or 'additions' to the framework.

From the outset of the study, panelists were strongly advised that the main strength of this study was the commentary offered by panelists. Therefore, panelists were reminded throughout to focus on written commentary rather than only on the quantitative portion. While the Likert-like scale would become an important criteria in establishing the second-round instrument and the final framework, the commentary would direct the alteration of further framework designs.

Part III: Retention Program Development. This part of the instrument detailed five separate areas covering particular aspects of program development and implementation, including:

1) Global Components/considerations required to develop an effective student retention program—This section identified potential considerations that administrators and practitioners should consider as benchmarks during the development of a student retention program.

The following areas outlined specific considerations regarding each stage of retention planning and implementation.

2) Stage 1 - Pre-planning
3) Stage 2 - Planning
4) Stage 3 - Implementation; and
5) Stage 4 - Program Monitoring.

The data was supplied in a similar pattern to that of Part II. Again, participants were asked to rate each consideration on a four-point Likert-like scale, and then add specific comments in the space provided (See Table 12).

Table 12. Excerpt of Stage 1 - Pre-Planning Response Instrument

	1. Analyze the size and scope of retention issue on campus	1	2	3	4
	2. Identify student needs on campus	1	2	3	4
	3. Assess the status and effectiveness of current retention strategies and programs on campus	1	2	3	4
	4. Identify institutional resources that may be utilized or redirected	1	2	3	4
	5. Identify successful retention strategies at other campuses	1	2	3	4
	Others:				

Please note—the physical proximity of the spaces illustrated in the figure have been changed to fit the parameters of this page. See Appendix C for exact specifications.

Part IV: Organizational Strategy for Campus Personnel. This part of the instrument illustrated an organizational chart originally developed by Beal and Noel in 1980 (See Appendix C). The purpose of this inclusion was to solicit reaction regarding the organizational/hierarchical management required to coordinate a campus-wide retention plan. No identification or credit was given to the authors in an attempt to solicit an unbiased response toward their approach to retention management. Panelists were simply asked to provide feedback regarding the organizational chart.

PILOT TESTING

Before the instrument was administered to the entire panel, a pilot test was first run to fine tune the instrument. The researcher distributed a draft copy of the round-one instrument to four persons—three expert panel members and one external participant—

to validate the appropriateness of the instrument. Their comments and suggestions were then used to modify the instrument for Round 1. Input from this audience included suggestions to add more detail to the rationale sections of Part II; rework the layout of the response instrument; limit the Likert-like scale to four points from five; and rewrite the instruction section. These and other advisements were incorporated into the final round-one instrument.

DISTRIBUTION OF THE ROUND-ONE INSTRUMENT

The first-round instrument was distributed midway through the month of May to each participant. Included in the packet were: (a) instructions on procedures and guidelines to be followed, including details on what to focus on and how to comment on the framework; (b) the framework; (c) a response instrument to return to the researcher; and (d) mailing procedures and supplies for the return of the material, including self-addressed-stamped envelopes (See Appendix C).

ANALYSIS OF ROUND-ONE RESPONSES

To control the amount of data that was collected in the round one process, two computer applications were used. To coordinate all of the qualitative data, the researcher created a special and unique database set with the aid of Filemaker Pro 2.0 software for the Macintosh. This program allowed the researcher to input information from each panelist on a separate file, or record, as it is termed in Filemaker Pro language. By doing this, the researcher was able to export data in a flexible pattern that would allow for analysis across items and across panelists. The quantitative data extracted from the scaled items were placed into a spreadsheet file using Microsoft Excel 5.0. This powerful spreadsheet program allowed the researcher to sort data and make statistical calculations.

The qualitative and quantitative data were compiled to create a general sense of how the panelists felt about the specific details regarding the conceptual framework. This data was used first to generate the second-round instrument, and then to develop and confirm the final framework design. The numerical data compiled from round one (the Likert-like data) was averaged and sorted to produce a hierarchical order of objectives under each category. This data refined the order of objectives as presented in the round-one instrument (See Appendix C). Although some objectives received low ratings, there was decision at this time to eliminate them from the framework.

The qualitative data collected from round one was categorized using the software package described earlier. The researcher combined comments to form themes regarding specific categories and objectives. This information resulted in the addition of several new objectives which were presented to the panel in round two. Most additions from round one were added to the framework, but the researcher did eliminate some additions due to (a) their redundant nature in comparison to objectives already in the framework, and (b) the lack of supportive data from the panelist or available in the literature to include the addition.

PREPARATION OF AND DISSEMINATION OF ROUND TWO

The round two instrument focused on the framework portion of the study. That is, the Part II component from round one which dealt with the objectives. The reason for this decision was two-fold: first, by focusing on this portion of the study, panelists were more able to focus their thoughts on one particular aspect of retention programming and implementation rather than the several components presented in round one. The researcher, advisors, and colleagues all agreed that reducing the scope of the study in round two would produce results that would be more useful to administrators and practitioners. Second, it was decided that the data compiled from Part I, III, and IV from round one was significant enough not to re-issue the data for a second round.

Additionally, the decision to reduce the size of round two was a politically sound venture considering the length of round one and the time that was requested of the panel.

The purpose of the second round (See Appendix E) was to assess the hierarchical order given to the framework objectives as defined by the round-one responses. The researcher, through the analysis of round one responses regarding level of importance, reordered the order of the objectives to correlate with the average importance rating given by the panel in round one. Thus, the panel was asked to validate the new order of the objectives. If they did not agree with the order, they were to reorder the set of objectives and provide rationale for the change. The researcher also added new objectives that were identified in the round one instrument. In this case, the panelists were asked to rate the new objective on the same four-point Likert-like scale as used in round one. The final direction given to the panel was to select the three most critical objectives from each component. That is, panelists had to choose three objectives from each component and present in order of their importance. This request was made to develop a priority level of action for universities in terms of establishing a student retention program. Finally, as always, panelists were also instructed to add any additional comments they felt compelled to add.

Enclosed with the six-page instrument was a cover letter introducing the panel to the second round (and thanking them for the first round), the appropriate return mailing materials, and a copy of the qualitative responses from round one, coded so not to exploit any particular person, but also coded so that individual participants could review their own comments. This was provided for their own interest. The instrument was mailed out at the end of June, and respondents were asked to return it before July 14.

ANALYTICAL PROCEDURES FOR ROUND TWO

The data from round two was also entered into both the database file and the spreadsheet file. The qualitative data was synthesized to provide an inventory of the commentary from the expert panel. These synthesis may be found in Chapter Four. The commentary provides some feedback from the panel that is extremely important to the meaning of a particular objective. As was found repeatedly during the first two rounds, although an objective may seem plausible as stated, there are many issues that must be considered in how each objective is developed and implemented. Therefore, the commentary is as important to the final framework as is the hierarchical order or the inclusion of the objectives, such that they should be bonded together in some fashion.

The reordering that was instructed of the panel was not conducted properly or completely by a number of participants. Only a few of the panelists completed this instruction properly, and a number of panelists did not proceed with this task at all. Therefore, this portion of the ordering process was eliminated in place of the use of previous data compiled from round one. In the case of the new objectives added to the round two instrument, the scaled data was introduced with previous data to develop a new hierarchical ordering of the objectives.

The data collected regarding the top three objectives for each component of the framework were also compiled in the spreadsheet. This data was inversely coded as to its rated importance, such that first choices were given '3' points, second choices '2', and the third choice was given '1' point. When calculated, the numerical figure resulting produced a rank order of the most important objectives for each component.

The results of round one and two are presented in Chapter Four. The redeveloped framework is then presented in its final form in Chapter Five.

CHAPTER FOUR

RESEARCH FINDINGS

The purpose of this study was to develop a conceptual framework to aid the planning and development of an institution-wide student retention program. To support this effort, it was deemed necessary to develop a framework which would incorporate the needs of an institution relating to student retention as well as a model for the planning and implementation process. In particular, this latter part was delineated as the pre-planning, planning, implementation, and monitoring stages of the program development.

To collect data appropriate to the purpose of this study, a two-round Delphi process was used. Each round of the Delphi was administered to an expert panel of 16 persons, from which 13 responses were received in each of the two rounds. The instruments themselves were developed to answer the researcher questions identified in Chapter One, of which the main question was:

- What are the program components and implementation strategies that form an institution-wide, student retention model for minority institutions interested in increasing the number of SEM graduates?

In addition, the following sub-questions were addressed:

- What are the significant factors related to student attrition and retention at minority institutions?
- What types of programs have been successful in increasing retention rates at four-year institutions, minority institutions, and in SEM areas?

- What are the key elements to be considered in the development and implementation of an institution-wide retention program?
- What policies are needed to support the development and implementation of an institution-wide student retention program?

The round one and two instruments were designed to solicit responses from the panel that would answer the above questions. However, due to the design of the instrument and the logical progression that was built into both rounds of this study, the presentation of data findings will not be based upon the questions as written, but rather, by the design of the first and second round instruments. This method will make better sense of the large data set that was derived from the study. Therefore, this chapter will be divided up into two larger sections: Round One findings and Round Two findings. These two sections will then be divided up based upon the instrumentation design utilized for each Delphi round.

ROUND ONE FINDINGS

The description of the round one findings is divided up into two broad sections: Part I - Institutional Components of Retention; and Part II - Retention Program Development.

Part I will discuss the five components identified which are main focus areas for retention programming: financial aid, recruitment and admissions, academic services, curriculum and instruction, and student services. The findings of each of each component will be presented and described.

Part II will focus on the five-part component of the framework which focused on the planning, implementation, and institutionalization of the framework design.

Institutional Components of Retention

In Round One of the study, the panel was first introduced to a five-component framework for student retention. As described above, these components included financial aid, recruitment and admissions, academic services, curriculum and instruction, and student services. Each component was divided into several categories which further defined the component. Typically speaking, each component, such as financial aid, had three to five categories. Each category was then further delineated by a listing of specific objectives relating to actions that could be considered for each category, and ultimately, each component. The role of the panel in this component of the instrument was to rate each objective on a four-point Likert-like scale and add specific comments.

This part of the chapter will present the panel findings regarding the 80 objectives identified in the Round One framework. The presentation of each component's findings will be divided up by each of the categories within that component. For purposes of clarity and focus, a listing of major findings for each category is first presented, followed by a discussion of these and other findings.

It should be remembered that the panel rated all objectives on a four-point scale. The mean ratings presented in this section range from 2.2 to 3.9. To help communicate the relative importance of these ratings, three classifications have been created: a *high mean rating* refers to values of 3.6 and above; *moderate mean ratings* fall between 3.0 and 3.6; and those values below 3.0 are considered *low mean ratings.*

COMPONENT ONE - FINANCIAL AID

The Financial Aid component, the lowest rated of the five components (GM=3.2), was divided up into four categories: Grants and Scholarships; Student Loans; Assistantships and Work Studies; and Financial Counseling.

Major Findings

- Communications between the college and student/family regarding grants and scholarships received a high mean rating (M=3.8).
- Maximizing the availability of grants and scholarships received a high mean rating (M=3.7).
- Panelists emphasized that fear of debt was an important issue related to student attrition.
- Frontloading grants and scholarships (M=2.8) received mostly negative comments from the panel.

Table 13. Means & Standard Deviations of Panel Ratings Regarding the Grants and Scholarships Objectives

Objective	M	SD
Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.	**3.8**	0.60
Maximize availability of Grants and Scholarships compared with Student Loans.	**3.7**	0.63
Frontload grants and scholarships to provide more support in the early years of college.	**2.8**	1.25
Grand Mean	**3.5**	**0.93**

Discussion

As illustrated in Table 13, identifying and informing students and families was the highest-rated objective in the grants and scholarship category (M=3.8). In total, 11 of the 13 panelists gave this objective a 'most important,' or '4' rating on the Likert-like scale. One panelist stated that the awareness factor was especially critical for first-generation college students, while another panelist felt that if students were adequately identified and informed, elaborate retention efforts would not be needed. However, other comments from the panel suggested that: (a) families do not plan in advance; and (b) financial aid offices do not always know what aid is available or how to inform families. One panelist suggested that, although this was an important area of concern, it was beyond the role or scope of the university and that high school counselors held the ultimate responsibility of connecting students with aid packages.

The second highest-rated objective was the maximization of grant and scholarship availability (M=3.7). Panel comments again suggested that families do not plan well for college, but also added that institutions are not always aware of the issues related to grant/scholarship availability. One panelist noted that the current over-dependence on student loans has "lead to a classist structure among colleges and universities," mainly due to the inequity among colleges and universities in ability to offer grants and scholarships. Two panelists specifically referred to the fear of loan debt as a deterrent to student persistence, and in one instance, the panelist stated that his college did not even offer loans to students because of the debt load incurred by students and their inability to repay them. Therefore, the panel recognizes that the availability of grants and scholarships is directly related to student persistence in college.

The panel responses regarding frontloading grants and scholarships were not very supportive, with a mean rating of only 2.8 and a standard deviation of 1.25, illustrating that the responses were scattered across the four-point scale. Panel comments were representative of the dispersion of scores, with panelists opting both for and against the use of frontloading practices, which simply refers to the practice of skewing financial aid payments such that student receive more funds during the early years of their college experience. One panelist stated that frontloading student aid would reduce the need for work and therefore afford the student more time on task. However, the majority of comments regarding frontloading were negative. Panelists felt that students need money every year of college and that many students need more money in the later years due to the expense of books and increased responsibilities.

Major Findings

- The entire category of student loans received the lowest support of any category within this study (GM=2.8).
- Informing students and families of loan information was the highest-rated objective in the category (M=3.2).
- The panel believed that streamlining of forms has made progress in recent years, much to do with computer-aided applications and information.
- Frontloading student loans was not a popular option among panelists, yielding a mean rating of only 2.2.

Table 14. Means & Standard Deviations of Panel Ratings Regarding the Student Loans Objectives

Objective	M	SD
Inform students & family members of availability and responsibilities related to Loans.	**3.2**	1.11
Streamline bureaucracy & forms to simplify the application process.	**3.1**	1.16
Frontload loan payments to provide more support in the early years of college.	**2.2**	1.32
Grand Mean	**2.9**	**1.23**

Discussion

The category of student loans was not highly regarded by the panel, as can be attested by the grand mean rating of 2.8 (See Table 14). Panelists were very critical of loans for students, suggesting that students are fearful of not being able to repay them because of the difficulty in finding jobs after college. One panelist acknowledged the additional pressure that fear of loan repayment can put on women as opposed to men. As explained, the extra pressure of pregnancy and child-rearing often forces women to leave college. Regardless, panelists felt that the communication of viable options was an important aspect of college planning, especially with regard to first-generation students. One panelist suggested that colleges should be providing parents and students with information illustrating the long-term benefits of a college degree by projecting earnings of college graduates versus high school graduates.

Streamlining the financial application process was moderately rated by the panel (M=3.1), but there was concensus that progress has been made in this area recently. It was suggested by one respondent that workshops and computer application software for parents and students would be very useful.

The response ratings regarding frontloading of loans (M=2.2) was negatively skewed, with 5 of the 13 panelists rating it 'least important,' and only two panelists rating it 'most important.' This response may be attributed to the overall negative view the panel held toward loans. Although a few panelists felt that frontloading would allow students to concentrate completely on their studies during the freshman year, others said that students need more support during the concluding stages of their degree, therefore opposing the practice of frontloading.

One additional objective suggested by a panelist was to make emergency loans available to students in times of need.

ASSISTANTSHIPS/WORK STUDIES

Major Findings

- The category 'Assistantships/Work Studies' received a grand mean rating of 3.5 for the entire category, highest of the four categories under financial aid.
- Increasing the availability of assistantships and work studies received a high mean rating of 3.9 and elicited 12 'most important' ratings from the 13 panelists.

- Faculty participation in assistantships and work studies received a high mean rating of 3.8 and also elicited 12 'most important' ratings from the 13 panelists.
- Keeping student assistantships and work studies below 25 hours per week was highly rated by the panel (M=3.8).

Table 15. Means & Standard Deviations of Panel Ratings Regarding the Assistantships/Work Studies Objectives

Objective	M	SD
Increase availability of assistantships and work study programs for undergraduate and graduate students.	**3.9**	0.28
Increase faculty participation with regard to student assistantships.	**3.8**	0.55
Keep assistantships and work studies under 25 hours per week for full-time students.	**3.8**	0.62
Develop partnerships with local area business to forge work and research opportunities for students.	**3.1**	0.79
Attempt to design assistantships and work study programs on or close to campus.	**2.8**	1.03
Grand Mean	**3.5**	**0.8**

Discussion

The top three objectives found in Table 15 were rated highly by the panel, receiving mean ratings of 3.9, 3.8, and 3.8 respectively. In fact, 12 of 13 respondents gave the top two objectives 'most important' ratings, while the third objective garnered a respectable 10 of 13 responses from the panel. Panelists reported that relevant, hands-on experiences are important for students, and allow students to become aware of potential academic and career opportunities while also allowing them to learn "the system." One respondent suggested that assistantships should support more research-related opportunities as opposed to teaching in order to develop relevant, hands-on experience within a student's chosen field.

The respondents supported the multitude of research that suggests faculty should increase their participation with students in assistantship programs (M=3.8). However, panelists advised that these situations were a "luxury" at large institutions, and that a revised reward system would have to be initiated to gain acceptance by faculty.

Panelists also were very supportive of keeping assistantships and work study programs under 25 hours per week for full-time students (M=3.8). In fact, two panelists suggested even less time, especially at research universities. One of the panelists was prompted to state this comment: "Fifteen hours per week at a research university is suicidal." Conversely, there were also comments about the reality of finances for students with inadequate funding. It was suggested that student earnings from assistantships/work studies had to be substantial enough to cover basic needs. If not, students would have to supplement their wages with other employment opportunities. Another panelist agreed, stating that "poor students (especially those with children) can't survive on less than 30-35 hours at low wages.

The last two objectives, "developing partnerships" and "designing on-campus assistantships" (See Table 15), received below average ratings of 3.1 and 2.8 respectively. Although the panel ratings were dispersed across the rating scale as compared to the clustering of higher-rated objectives, the comments regarding these two objectives were positively skewed. In terms of partnerships and coops with local area business and industry, one panelist noted that coops were more applicable in some majors than in others, and that engineering was one area in which students benefited greatly. Another panelist suggested that the development of internship arrangements that allow students to work into full-time positions are excellent opportunities. However, one panelist duly noted that the limitations that some communities face due to availability can limit their access to these types of business opportunities.

Panelists were least inclined to support the need to design assistantships and work study programs near or close to campus. One panelist framed the issue by saying, "The main issue is relevance, not distance." Other agreed, saying that better or most appropriate opportunities may not be close by, and that experience is more important than distance. Only one panelist commented positively, stating that research by Astin and others found evidence for increased involvement in campus life when working on campus.

FINANCIAL COUNSELING

Major Findings

- Informing students and families of financing college received a high mean rating from the panel (M=3.9).
- Training of financial counselors to be sensitive to issues related to race and ethnicity received a moderate mean rating (M=3.3).
- Money management training for students and families as well as monitoring student money usage both received below average mean ratings (M=2.9 and 2.4 respectively), and the later received extremely negative commentary from the panel.

Discussion

Similar to the findings regarding grants, scholarships, and loans, panelists were very supportive of the need to communicate the financial aid processes to students and families (M=3.9; See Table 16). One panelist suggested that colleges take the initiative to educate families about financial aid by getting them to think of loans as an investment for the future. Additionally, informing families of potential incomes through projections of high school, undergraduate, and graduate students would also help families make important decisions regarding college. Another panelist was surprised and/or disappointed that information to families was a problem area: "This should not even be an issue. Why is this not done?"

Table 16. Means & Standard Deviations of Panel Ratings Regarding the Financial Counseling Objectives

Objective	**M**	**SD**
Inform students and families of all available options related to the financing of college.	**3.9**	0.30
Train financial counselors to be sensitive to issues related to race and ethnicity.	**3.3**	1.06
Provide money management training to students and families.	**2.9**	0.90
Monitor student money usage during college.	**2.4**	0.84
Grand Mean	**3.1**	**0.97**

The panel gave the "sensitivity training" objective a moderate rating (M=3.3). Many panelists felt that this objective was too ambiguous and misdirected, and needed to provide more specifics. "This is a class-sensitive rather than race-sensitive issue. A red herring. Need is need is need."

Providing money management training to families and monitoring student money usage received extremely low ratings by the panel (M=2.9 and M=2.4 respectively). In terms of the first objective, some panelists thought that it was not the role of the university to provide this type of training, while others added comments such as "easier said than done" and "good idea, but..." Monitoring student money usage raised questions from the panel. The panel felt that this practice could be both intrusive and threatening to students. As well, many panelists asked whether such monitoring was even legal.

COMPONENT TWO - RECRUITMENT AND ADMISSIONS

The Recruitment and Admissions component was the fourth highest-rated component in the framework, and was divided up into three categories: Student Identification, Admissions, and Orientation.

STUDENT IDENTIFICATION

Major Findings

- Working with pre-college programs to identify potential students received a high mean rating of 3.8, as did monitoring student participation in these programs.
- Matching student goals with those of the institution (M=3.5) received extremely positive comments and support from the panel.
- Ratings regarding the focusing of outreach programs were mixed due to confusion about the meaning of 'prime targeted.'
- The panel recommended using alumni networks to identify and recruit students.

Table 17. Means & Standard Deviations of Panel Ratings Regarding the Student Identification Objectives

Objective	**M**	**SD**
Work with pre-college programs to identify potential recruits.	**3.8**	0.39
Monitor the participation of students enrolled in pre-college programs.	**3.8**	0.39
Attempt to match student academic and career goals with the institutional mission of the campus.	**3.5**	0.67
Develop and focus outreach programs on the prime-targeted population of the university.	**2.8**	1.23
Grand Mean	**3.5**	**0.81**

Discussion

Panelists were very supportive of utilizing existing pre-college programs as a recruitment tool (M=3.8; See Table 17). Several panelists felt that this was an excellent way to recruit "motivated, well-developed students," and, as one panelist in particular expressed, "the earlier you start this initiative the better." Others identified programs such as HSF Young Scholars, Minority Biomedical Research Support Program (MBRS), Southeastern Consortium for Minorities in Engineering (SECME), and the Mathematics and Science Education Network (MSEN), are examples of programs which could be used to identify new recruits. However, one panelist cautioned that pre-college programs vary in quality and could be counterproductive to the intent of this objective.

Monitoring student participation in pre-college programs was also highly rated by the panel (M=3.8), although panel members were wary of the ability or need to tightly monitor all programs. Some panelists felt that the variability of program types would make this type of monitoring difficult, and as one panelist mentioned, "not all (programs) need tight monitoring." Other panelists supported the practice, suggesting that the college develop an "active on-going articulation with the local school system" in order to facilitate monitoring needs.

Matching student academic and career goals with the institutional mission did not rate as high as the previous two objectives (M=3.5), but received mostly supportive comments from the panel. The panel indicated their belief that current practices do not reflect this particular objective. In particular, the panel was concerned about the lack of career counseling given to students, the availability (lack of) of goal-setting programs for students, and the number of colleges with vague institutions missions. In support of this objective, one respondent suggested that institutions should not wait until the student matriculates to determine whether the goals and mission are in harmony. Other panelists simply added comments like "very important" and "absolutely!!"

The objective regarding focusing outreach programs on the prime-targeted population was unfortunately mis-communicated to the panel. The vagueness in which it was written (in particular, the use of the term "prime-targeted") confused many panelists. Therefore, any worthwhile comment that the panel may have offered regarding this objective was spoiled.

Additional objectives offered by the panel included (a) the use of alumni networks to increase outreach and enrollment, and (b) the use of work study students and student teachers to make visitations to middle and high schools to inform students of needs, promote learning, and preparing for college.

ADMISSIONS

Major Findings

- Alternative methods of assessment, including portfolios and interviews, received a mean rating of 3.4 from the panel.
- Panel response to SATs was negative skewed.

Table 18. Means & Standard Deviations of Panel Ratings Regarding the Admissions Objectives

Objective	M	SD
Incorporate portfolios, interviews, and other non-cognitive assessments.	3.4	1.00
Reduce the weight of SAT, ACT, and other tests.	3.3	0.95
Grand Mean	**3.4**	**0.95**

Discussion

The utilization of student portfolios, interviews, and other non-cognitive assessments as screening instruments received a moderate mean rating of 3.4 from the panel, with 8 of 13 panelists rating it 'most important' (See Table 18). Aside from two comments negating the use of SATs, the most relevant comment was the advise to use a college's institutional research department to study the predictive factors of admissions and base admissions strategies upon the results. Another panelists supported this advise, mentioning that some colleges currently conduct this research effectively, and have "gotten the balance down" between the different assessment methods. Attempting to ensure that not only quantitative methods were used to screen students, one panelist advised that the focus should be on personal assessments by people who know the students, rather than the standard assessments that are currently used by departments.

ORIENTATION

Major Findings

- The orientation category was the highest-rated category within the admissions and recruitment component (GM=3.6).
- On-campus living opportunities for pre-college students was rated highly by the panel (M=3.8).
- Providing early orientations for families and the involvement of the total campus in orientations both received mean ratings of 3.7.
- Satellite orientations, although noted as a viable method of orientation and garnering a moderate mean rating of 3.5, received a cool response from the panel.
- Suggested additions include a mandatory freshman orientation program for credit.

Discussion

Most of the objectives within this category were highly rated by the panel. In fact, only one objective scored under the mean for all 80 objectives (GM=3.5 for the entire framework) within the study (and this by only 0.1). As listed in Table 19, giving students an early campus experience (M=3.8), providing orientations for families

(M=3.7), and involving the entire campus in the orientation activities (M=3.8) were rated very high by the panel.

Several panelists supported on-campus experiences for students, suggesting that they Table 19. Means & Standard Deviations of Panel Ratings Regarding the Orientation Objectives

Objective	M	SD
Provide opportunities for pre-college students to live on campus.	**3.8**	0.44
Provide early orientation activities for families.	**3.7**	0.63
Involve all campus departments in the orientation process.	**3.7**	0.63
Provide satellite orientations for non-local students.	**3.5**	0.69
Ensure personal communications with students and families via phone and visitations.	**3.4**	0.67
Grand Mean	**3.6**	**0.64**

work well and help develop a "sense of belonging" for the student. Three panelists in particular cited summer bridge programs as evidence of the success of these types of programs can have on student learning and acclimation to the campus.

Panelists were supportive of early orientations for entire families, especially for families whose parents had not attended post-secondary institutions (educational legacy). As one panelist described, early orientation opportunities "reduce the anxiety of parents as well as students." However, two panelists noted that family participation is often difficult, and distance can often prohibit such involvement.

Another objective in this category, the use of satellite orientations as an alternative opportunity for out-of-town families, raised more questions than support, even though it received moderate ratings from the panel (M=3.5). Panelists asked about the logistical and technological constraints regarding satellite orientations, including facilities, timing, and the technological ability to do it. One panelist in particular did not believe the objective was well suited for campus orientation, stating that "students should be on-campus."

Providing personal communications with students and families (M=3.4) was supported by the panel, but comments were laden with queries about the constraints and practicality. One panelist supported the objective by stating that "personal contact is absolutely essential!" Another panel member, while asking whether this objective was practical for contacting families far from campus, quickly suggested using alumni contacts to assist in these cases.

In terms of additions to this category, one panelist suggested that a freshman orientation class should be mandated on campus. The class should be scheduled for a minimum of one term, but preferably one year. Additionally, students should receive credit for the orientation course.

COMPONENT THREE - ACADEMIC SERVICES

The Academic Services component received the highest average mean rating of all five components within the framework, and was divided up into six categories: Academic Advising, Supplementary Instruction, Tutoring/Mentoring, Research Opportunities, Pre-College Programs, and Bridging Programs.

ACADEMIC ADVISING

Major Findings

- Regular academic advising and counseling for students received a high rating from the panel (M=3.8).
- Panel comments suggest that faculty members should be utilized and trained for academic advising whenever possible.
- Logging student-faculty interactions received mixed reviews from the panel and a moderate mean rating (M=3.1).

Table 20. Means & Standard Deviations of Panel Ratings Regarding the Academic Advising Objectives

Objective	M	SD
Provide academic advising and counseling for students on regular basis.	3.8	0.38
Provide appropriate training in academic advising for faculty.	3.8	0.38
Use faculty for the academic advising students when possible.	3.8	0.62
Keep log of student/faculty-staff interactions in a computerized monitoring system.	3.1	1.24
Grand Mean	3.6	0.78

Discussion

The panel responses regarding the provision of regular advising and counseling services were very positive (M = 3.8, See Table 20). In particular, the panel felt these issues were very important, especially early on the college career. One panel member stated that a "pro-active system required to schedule meetings/advisements with students could catch problems before they develop." Other panelists, however, were dubious of the outcome of the advisements. The quality of the advise given to students ("Does the advice have an evidentiary basis?") and student attitudes toward advisements were identified as constraints. One panelist suggested looking at how good liberal arts colleges conduct their advisement sessions compared with larger institutions.

The panel strongly supported the use of faculty members for academic advising purposes (M=3.8). In doing so, they also identified a number of issues which should be considered, including faculty training, implementation of an effective faculty incentive system, and the importance of defining the faculty role. Panelists advised that institutions should not strive to utilize all faculty as advisors, as some are effective in this role while others are not. However, the panel underscored the importance of utilizing faculty members in this role because they are the people committed to students and also know the academic infrastructure of the university.

The panel also acknowledged the importance of faculty training (M=3.8) with regard to academic advising. Panelists identified issues related to tenure and ability as potential barriers to success. One panelist commented, "Students report that faculty do not know the answers--and may give wrong information, with unhappy consequences (esp. re: degree requirements)." Thus, it would seem that training and screening of faculty advisors would be an important consideration.

Most of the response generated by the computerized monitoring system was, as mentioned, skeptical. One respondent in particular summed his thoughts up this way: "You're kidding--very expensive and would hinder spontaneity--I see 30 students informally a week." Others felt the idea would be too time consuming, have little impact, and become, as one panelist described, "paperwork for paperwork." There were positive comments supporting the objective, but even these had conditions: "Interesting idea—faculty will worry about accountability, access to records, academic freedom"; "OK—but faculty commitment is the key."

One panel member felt that this area was "hopelessly shallow," and that the issue of student advising was based on the "management and interaction of the different messages that students receive." Another member stated that the non-verbal communications from faculty were particularly important.

SUPPLEMENTARY INSTRUCTION

Major Findings

- Supplementary Instruction was one of the highest rated categories in the study, with an grand mean rating of 3.7.
- Twelve of thirteen respondents rated the use of peer study groups as 'most important,' resulting in a mean rating of 3.9.
- Using a variety of instructional practices in supplementary instructional courses was highly rated (M=3.9), but panelists raised questions about practicality.

- Utilizing student peers as instructional personnel was highly rated by the panel (M=3.8).
- The panel response concluded that study courses and other learning skills should be offered through supplementary instruction courses (M=3.7).

Table 21. Means & Standard Deviations of Panel Ratings Regarding the Supplementary Instruction Objectives

Objective	M	SD
Encourage the use of peer study groups to foster learning and incorporate more labs with glass work.	3.9	0.28
Incorporate a variety of instructional methods to support student learning	3.9	0.32
Utilize peers as instructional personnel for supplementary instruction when possible to assist students.	3.8	0.62
Offer supplementary courses that focus on academic support skills (e.g., study skills, note taking, listening, writing, reading, time management) and academic content (e.g., biology, calculus, etc.).	3.7	0.47
Monitor all supplementary instruction activities by students and log into the computerized database.	3.2	1.03
Grand Mean	**3.7**	**0.62**

Discussion

The category of "supplementary instruction" was one of the highest-rated categories in this study, with a mean rating of 3.7 listed (See Table 21). In fact, the lowest-rated objective in this category, "monitoring supplementary activities," still received a moderate rating of 3.2 from the panel. All other objectives rated 3.7 or above and elicited 'most important' responses from at least 3/4 of the panel members.

The use of peer study groups and peer instructional personnel were well supported (M=3.9 and M=3.8 respectively). Panelists cited the work of Treisman and Slavin as positive examples of collaborative learning in practice. In terms of peer groups, panel members commented that peer groups should be organized even if students didn't want them. However, one panelist stated that the research is not conclusive in terms of the acceptance of group learning from different minority groups. In particular, the panelist cited a study which found that same-minority group peers supported failure and under-achievement among black males. Panelists also supported peers as instructional personnel, and suggested that they be chosen carefully, be paid decently, and receive proper training. In terms of training, one panelist stated that the peers must be cognizant of the academic infrastructure and be connected to the faculty. Another panelist suggested that some study groups should be led by faculty and trained graduate students as well.

Focusing supplementary courses on academic support skills and academic content generated a broad range of comments while still maintaining support (M=3.7). One panelist stated that students find these types of courses very valuable, and that students "report regret in not 'discovering' these services sooner." Another panelist suggested that these courses be required for all students, while another stated that the organization and placement of these courses within the institution is the key to their success. One respondent disagreed with this concept: "I disagree with this concept that there is a deficiency in 'ability.' NO! The ability is there! It is the 'experiences'." .

Panelists cautioned against the monitoring of supplementary courses. Two panelists noted that monitoring may have cultural and economic implications. Other comments supported monitoring as an interesting concept "that could be part of a larger information system" and may help catch students before they "slip through the cracks."

Additions to this category included an early assessment of student learning styles to support a variety of instructional approaches.

TUTORING/MENTORING

Major Findings

- The tutoring/monitoring category was also one of the top-rated categories in this study, with a grand mean rating of 3.7.

- Panelists rated the provision of regular-scheduled tutoring activities highly (M=3.9), but suggested that students' attitudes toward these services were barriers to use.
- The use of RAs, TAs, and exemplary undergraduates as tutors (M=3.8), in addition to incorporating peer tutoring and group studying (M=3.7), were highly supported by the panel.
- Faculty time with students outside of class is an important component of academic support (M=3.8).

Table 22. Means & Standard Deviations of Panel Ratings Regarding the Tutoring/Mentoring Objectives

Objective	M	SD
Provide regularly scheduled and easy access tutoring for students with regard to course work.	3.9	0.29
Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors.	3.8	0.44
Encourage faculty to support the academic needs of students outside of class time.	3.8	0.44
Encourage peer tutoring and group studying within class population.	3.7	0.49
Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.	3.5	0.78
Grand Mean	**3.7**	**0.52**

Discussion

Panelists were very supportive of the Tutoring and Mentoring category (GM=3.7; See Table 22), and gave some fruitful advise in regard to the specific objectives outlined under this category. In terms of providing regularly scheduled tutoring, panelists suggested that: (a) tutoring was directly related to the courses/departments; and (b) there is an emphasis on immersive rather than remedial instruction. The most generalized comment from the panel was the need to get students to the session. Panelists suggested that student attitude, and not accessibility, was the most critical barrier to the use of these services. One comment in particular suggested that tutoring courses will not attract students if they are referred to as 'remedial.' Another panelist identified funding as another barrier for student access to tutoring, commenting that many students have to pay for tutoring at the present.

The use of research assistants (RAs), teaching assistants (TAs), and exemplary undergraduates as tutors was also strongly supported by the panel (M=3.8), but the issue of pay and funding was identified as a pitfall. One constraint observed by a panelist was that TA and RA use is limited by departmental budgets and course needs within departments.

Respondents were not positively motivated about the issue of faculty involvement. Some panelists felt that the burden upon faculty to assist students outside of class time was already heavy, while another simply stated that it would be "hard to do."

The comments regarding peer tutoring and group studying (M=3.7) were supportive, but cautiously optimistic. Questions regarding the identification and recruitment of peers were levied, as well as concerns about the positive nature of peer groups. Two respondents felt that caution should be exercised because of the ability of some groups to be more destructive than supportive, thus potentially polarizing groups.

The comments regarding the use of minority members as tutors and mentors (M=3.5) was also cautiously stated by the panel. One panel member stated that this role is already a burden on faculty and students of color and hinders some persons who are trying to excel. This objective has important policy implications, including that of faculty tenure and reward structures. Other panelists questioned whether race/ethnicity or gender consideration is absolutely necessary when compared with ability and knowledge. As one panelist remarked, "Strong evidence exists suggesting that some women faculty regret the approach of younger women looking for help."

Additions to this category include the addressing of rewards for faculty who monitor students and the use of residence halls in the programming of supplementary instruction activities.

RESEARCH OPPORTUNITIES

Major Findings

- Faculty involvement with students on research projects was highly rated by the panel (M=3.8).
- Panelists mentioned the importance of incorporating real-world application and hands-on learning in math and science activities.
- Utilizing research as a curricular activity was highly rated by the panel (M=3.6).

Table 23. Means & Standard Deviations of Panel Ratings Regarding the Research Opportunities Objectives

Objective	M	SD
Support faculty to work with students on research projects.	**3.8**	0.38
Integrate regular research activities into curricula.	**3.6**	0.65
Develop industry partners for research opportunities.	**3.5**	0.66
Encourage business and industry to participate on campus through in-class demonstrations and experiments.	**3.3**	0.85
Grand Mean	**3.6**	**0.67**

Discussion

The panel was very supportive of further developing the research agenda in terms of student learning. Supporting faculty to work with students was the highest-rated objective (M=3.8; See Table 23), and the integration of regular research activities into the curricula would, as suggested, "get students thinking about research as a viable career path."

Panel members suggested that hands-on experience, the application of math and science to real-world problems, and the networking exposure of research opportunities developed through industry partnerships were important considerations. One panelist cautioned that the "spatial heterogeneity of 'appropriate' businesses" makes the development problematic. In terms of business and industry participation on campus, one comment suggested that student organizations, such as women's organizations and some ethnic organizations (e.g., NACME), already do this well and should be promoted on campus.

PRE-COLLEGE PROGRAMS

Major Findings

- Developing pre-college programs at the elementary and secondary education levels was highly rated by the panel (M=3.7).
- The panel expressed concern over the future funding of pre-college programs.

Table 24. Means & Standard Deviations of Panel Ratings Regarding the Pre-College Programs Objectives

Objective	M	SD
Develop pre-college programs at the elementary and secondary education levels.	3.7	0.49
Monitor student progress in pre-college programs.	3.6	0.51
Offer pre-college programs on and off-campus.	3.5	0.66
Grand Mean	**3.6**	**0.55**

Discussion

The concept of pre-college preparatory and motivational programs at the elementary and secondary education levels received high ratings by the panel (M=3.7; See Table 24). Some panelists identified some exemplary pre-college programs, including MESA, MSEN, SECME, and PRIME, illustrating their awareness of pre-college benefits. One panelist believed that pre-college programming was an important part of making students aware of what courses they need to take for optimal preparation. However, it was also commented that most colleges, universities, "and also the mind-set of faculty" would have to undergo major reform to institutionalize the need to work at the pre-college level.

The nature of a pre-college program is an essential element to its success, commented one panelist. "It's the character of these programs that matters--there are many expensive counterproductive ones." In terms of when to start a pre-college program, one panel member simply stated, "you can not start too soon."

Further commentary on the objectives in this component was limited. However, panelists did make brief comments, suggesting that pre-college programs be held on campus and questioning how these programs would be funded in "austere times."

BRIDGING PROGRAMS

Major Findings

- Panel response for the category "Bridging Programs" was the highest in the entire study, with a grand mean rating of 3.8.
- Providing students with on-campus residency opportunities during bridging programs received a high mean rating of 3.9.
- Panelists rated the inclusion of academic and social support programming during bridge programs high (M=3.9) and provided examples of exemplary programs which they felt provided this support.

Table 25. Means & Standard Deviations of Panel Ratings Regarding the Bridging Programs Objectives

Objective	M	SD
Provide on-campus residency for students during bridging programs.	3.9	0.28
Provide summer academic and social support for admitted students before the commencement of the freshman year.	3.9	0.29
Monitor all student progress in bridging programs.	3.5	0.90
Grand Mean	**3.8**	**0.58**

Discussion

The panel was very supportive of the inclusion of bridging programs, as evidenced by the 3.8 grand mean rating attributed to this category (See Table 25). Throughout the comment section for this category, panelists cited several examples of exemplary bridging programs that have been developed by the NSF, NIH, DOE, and NACME. It was commented that these types of bridging programs would offer good opportunities to orient students to the services, expectations, and other factors of college life. However, another panel member suggested that researchers and colleges need to isolate characteristics of effective programs in order to fully understand what works well and what doesn't. Otherwise, it is possible that poor programs could be replicated on campuses. The panel also supported the concept on-campus residency during the bridging program was supported, and it was suggested that an offshoot of this could be the development of a peer group for first-year support.

There were very few comments regarding the monitoring of student progress in bridging programs, making it difficult to identify if there were any specific concerns from the panel. In lieu of comments, the panel did raise questions, including: "How do we create a culture that seeks data for pedagogical and curricular decision making. Creating data without it is an expensive waste." "Need specifics on everything selected to be monitored;" "Sure, but how?"

COMPONENT FOUR - CURRICULUM AND INSTRUCTION

The Curriculum and Instruction component was the third highest-rated component on the five components, and was divided up into three categories: Curriculum Review & Revision, Instructional Strategies, and Assessment Strategies.

CURRICULUM REVIEW AND REVISION

Major Findings

- Developing an ongoing review and revision process for curricula was highly rated by the panel (M=3.9), with 12 of 13 respondents giving it a 'most important' rating.
- The panel cautioned against overemphasizing 'interdisciplinary' and 'real-world learning' in place of solid foundations and theoretical knowledge.
- The panel commented that redesigning curricula with instructional media in mind was limited by the resources allocated for faculty development.

Table 26. Means & Standard Deviations of Panel Ratings Regarding the Curriculum Review and Revision Objectives

Objective	M	SD
Develop an ongoing review process of curricula utilizing faculty input and outside consultation.	**3.9**	0.28
Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students.	**3.5**	0.67
Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction.	**3.4**	0.67
Grand Mean	**3.6**	**0.59**

Discussion

An ongoing review process of university curricula was the highest-rated objective under the category of Curriculum Review and Revision (M=3.9; See Table 26), with 12 of the 13 panelists rating it 'most important' on the four-point Likert-like scale. One panelist outlined areas to be addressed during this process, including the inclusion of certain elements, such as the inclusion of writing practices in every class across the curriculum. Additionally, he suggest that curricula should be developed to incorporate all core competencies of a department into the first two years of a program. One other major comment that was generated by the panel regarded research-based curriculum reform. The panel member suggested that the review and revision process should be linked directly to research in teaching and learning to ensure validity.

The objective regarding interdisciplinary and real-world instruction, although moderately rated by the panel (M=3.5), raised questions regarding recent trends in these areas. "This (real-world) can be over-emphasized" and "this has been over-played" were examples of comments collected from the panel. Panelists suggested that students needed more balance in their learning and required theoretical underpinnings of a discipline before relevance could have impact. Comments from supporters of this objective also identified potential barriers to its effectiveness, including the limited experience of faculty in developing these areas of expertise. The development of an interdisciplinary center for faculty development was identified by the panel as a proactive method of introducing this and other objectives into the institution.

The utilization of computer-aided instruction and technology was given a cautious welcome by the panel, although it also received a moderate mean rating of 3.4. Several panelists felt that educational technologies were currently being overplayed. One panelists in particular made a valid technical point, noting that practices like instructional technologies do not *increase* quality, but rather, *improve* quality. He further added: "Let us not imply that this is 'the answer to it all." Panelists also questioned the relevance of instructional technologies to student persistence, the implied reduction of teacher-learner contact, and, as one respondent cited, the implication of "unintended effects on access" to technology. Among the supporters, there were comments noting the importance of linking educational technologies to current research as well as faculty training to implementation.

Additional comments by the panel at the end of the category implied that they understand the scope of the problem in many of today's college classrooms and how instructional technologies may be utilized to revise this practice. One panelist acknowledged that the "dullness" of material taught and the poor organization of materials presented in lectures are serious, common problems, and that this "turns off bright students." Another comment suggested that the Internet and other telecommunications technologies could be utilized to communicate with other practitioners around the world who are addressing similar issues.

INSTRUCTIONAL STRATEGIES

Major Findings

- Professional development opportunities related to instructional strategies was highly rated by the panel (M=3.8).
- Panel comments suggest that methods used for professional development is an important consideration in fostering professional growth.
- The use of highly interactive and active instructional strategies were highly rated by the panel (M=3.7).
- The panel often commented on the need for a balance of instructional techniques and strategies throughout all of the objectives in this category.

Table 27. Means & Standard Deviations of Panel Ratings Regarding the Instructional Strategies Objectives

Objective	M	SD
Provide appropriate instructional training for teaching faculty.	**3.8**	0.40
Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students.	**3.7**	0.48
Provide homework, out-of-class assignments, and in-class assignments for students.	**3.4**	0.90
Utilize educational technologies to complement instruction.	**3.4**	0.51
Grand Mean	**3.6**	**0.61**

Discussion

Professional development was the highest-rated objective in this category (M=3.8; See Table 27), and was seen as an important aspect of improving curricula and pedagogy in colleges and universities. One panelist suggested that if instructional training and change doesn't happen now, "nothing new will be initiated or sustained." Another supporter suggested coupling professional development and teaching to college criteria for promotion and tenure on campus as a means of raising the importance of this area within academia. One comment in particular seemed to sum up the importance and concerns associated with faculty training: "Teaching faculty and TAs how to teach is an urgent matter. However, their willingness to accept the need to learn is even more urgent. Their attitudes towards education departments and the knowledge they could offer is generally very negative--but this is an important resource." One panelist was particular sensitive to this issue and suggested that the objective itself was biased against the faculty by using the term "training." He added that a proactive model should build on the strengths of faculty members and should respect the way they learn.

Balance was seen as a critical issue in terms of the incorporation of interactive, relevant, hands-on, exploratory instructional practices. Comments suggested that a balance of methods is perhaps the most optimal technique, and as one panelist stated, the real issue would be trying to persuade the faculty to try them. Other panelists emphasized the need to connect instructional reform with K-12 efforts, such as the NCTM standards.

A balance of practices was also suggested in terms of providing homework and in/out of class assignments for students. Again, the issue raised by one panelist reinforced the need to persuade faculty to learn about new techniques of teaching and to risk trying them. As well, one panelist remarked, "The difficulty is creating a 'multi-directional' learning experience while maintaining coherence, depth, and breadth in curricula." Thus, panel comments suggest that faculty development is a key aspect to the success of this objective.

One panelist suggested that the importance of professional development and infusion of instructional technologies into instructional reform necessitates the creation of a separate category in this framework entitled "faculty development/resources." The panelist identified the development of centers for teaching excellence, funding of grants for classroom research, and the redefinition of the faculty reward system as important areas to consider. Another panelist added that the university, and in particular the instructors, must work to "sell" the environment, whether it be through lecture, coaching, facilitating, or other models, to students.

ASSESSMENT STRATEGIES

Major Findings

- Increasing the use of student assessments which require and support higher-level thinking was an issue that was well supported by the panel (M=3.8), although panelists thought it could have been taken much further.

- There was no distinct correlation between the importance of extensive, regular assessment with the need to utilize this data for analysis of student development.
- Panel members linked the level of knowledge required by faculty to undertake these objectives with the prerequisite need for faculty development.

Table 28. Means & Standard Deviations of Panel Ratings Regarding the Assessment Strategies Objectives

Objective	M	SD
Develop assessment instruments that ask students to synthesize and transpose information to new situations.	**3.8**	0.39
Conduct extensive student testing and assessment on a regular basis to monitor student progress.	**3.8**	0.45
Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.).	**3.7**	0.49
Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment.	**3.2**	1.07
Grand Mean	**3.6**	**0.7**

Discussion

As can be seen in Table 28, three of the four objectives listed received high mean ratings from the panel (3.8, 3.8, and 3.7 respectively). However, the panel's commentary was quite critical toward the simplistic phrasing of the objectives. For instance, in terms of the first objective regarding developing higher-order assessment instruments, two panelists specifically questioned the reduction of the learning taxonomy to two distinct intellectual skills. One of the panelists said this: "Sure, but how about analyze? How about imagine? How about challenge? Why just synthesize and transpose?" Therefore, in light of the mean rating of 3.8 given to this objective, the commentary suggested that the objective does not cover enough ground to be entirely useful or plausible.

Interesting enough, the objectives regarding extensive student testing and the use of a computer monitoring system received far different reactions from the panel, as illustrated by the mean ratings provided by the panel (M=3.8 and M=3.2 respectively). While there were no distracters to extensive assessments, there was not much support for utilizing this data for analyzing student development and outcomes. It may have been expected that if the panel supported the first objective they would probably support the latter. However, panel comments suggested that monitoring and analysis, at least in light of how they read into the objective, is premature considering the current capacity of colleges in this area. One panelist commented: "Unless we get the nature of student assessments addressed, there is no point recording the outcome." Illustrating the diversity of the panel, a supporter rejected this viewpoint and suggested that relational databases and on-going monitoring should be incorporated into the framework.

The panel comments regarding the use of a variety of assessment techniques were mostly positive, corresponding positively with the high mean rating of 3.7. One panelists commented "Very, very good!," while others offered advice, such as to "include frequent written and oral communication opportunities in all courses." However, one panelist argued against this objective suggesting that student learning preferences was a weak reason for modern assessment.

There were several comments throughout this category identifying the need to incorporate professional development with the implementation of new assessment strategies. Panel members often identified faculty knowledge as the barrier to success in terms of implementation.

In offering additions to this category, one panelist suggested that there are a list of priorities that are important here, including:

(a) persuading faculty that weeding out is not the main objective of student testing methods in the earlier years;

(b) giving faculty access to learning theory and practical options for student testing (e.g., developing contacts with education faculty skilled in the teaching of science and mathematics); and

(c) encouraging faculty to see pedagogical reform as a professional priority, and supporting their attempts to change, including addressing remuneration, tenure, promotion and other rewards-for-change issues.

COMPONENT FIVE - STUDENT SERVICES

The Student Services component, the second highest rated of the five components within the framework, was divided up into four categories: Campus Climate, Accessibility -Transportation, Housing, and Counseling.

CAMPUS CLIMATE

Major Findings

- Campus climate was one of the highest-rated categories in the entire study (grand mean rating = 3.7), with four objectives rated 3.8 or greater.
- Seventy-nine percent of panel ratings in this category were 'most important,' resulting in a low standard deviation.
- Providing a pluralistic environment was the highest-rated objective in this category (M=3.9).
- Three objectives had mean ratings of 3.8: supporting the need of a safe campus, harboring social activities and opportunities for students, and providing non-classroom interactions for faculty members and students.

Table 29. Means & Standard Deviations of Panel Ratings Regarding the Campus Climate Objectives

Objective	M	SD
Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula.	3.9	0.28
Provide a safe campus environment for all students, faculty, staff, and visitors.	3.8	0.38
Provide non-classroom opportunities for faculty-student interaction.	3.8	0.58
Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events.	3.8	0.45
Support the organization of student clubs, associations, and fraternal organizations on campus.	3.3	0.78
Grand Mean	3.7	**0.54**

Discussion

The findings of the panel in regard to campus climate was extremely supportive (M=3.9; See Table 29). In fact, this category was one of the four highest-rated categories in the entire framework, with a grand mean rating of 3.7 for all 5 objectives. The support for the objectives may also be measured by the concentration of the ratings along the four-point scale. In terms of all ratings given in this category, 79 percent of all panel ratings were 'most important.'

The provision and support of a pluralistic environment was the highest-rated objective by the panel (M=3.9). The predominant theme in terms of the panel comments was to ensure that multiculturalism was "real" and did not create a false sense of diversity. As one Native American panelist stated, "care to have multiculturalism be real rather than 'let's have a pow-wow for the Indians'." Another panelist warned that universities should be mindful of the backlash that may occur when diversity is "oversoid." A third warning suggested that how pluralism and diversity is conducted on campus is of major importance: "Almost all campuses say they do the above, yet many a chilly environment exists." The panel also commented on how to maintain such an environment. One comment stated that diversity must be valued and clearly evidence throughout the curriculum, while the second panelist pointed toward the need for multicultural training for all campus security staff.

Some interesting comments were included in the discussion regarding social opportunities for students. One panelist urged that departmental initiatives are more important than institution-wide activities, in that they tend to create a stronger bond to the student's major. Another interesting point raised was the importance of integrating off-campus students into mainframe activities on campus. Also added was the need to integrate non-traditional students in similar activities.

Providing a safe campus environment, non-classroom opportunities for faculty-student interaction, and social opportunities for students all received mean ratings of 3.8 from the panel. One particular panel comment remarked that "safe" should also connote freedom from racial/ethnic discrimination. Comments regarding the latter two objectives including the need to think departmentally rather than institution-wide, and that peer group acceptance is an important goal of an institution.

Although one panelist supported the incorporation of student-led organizations as an important part of campus life, not all panelists held this viewpoint. "One that integrates does not segregate," replied one panelist, while another added, "Some fraternal organization experiences can be distracting and detrimental to focus on academics." Still another panelist stated that the support depending on the relation of the 'clubs' to the institutional mission and integration of students into campus life. This panelist suggested that students could gain greatly from the opportunity to network and build career focus with their peers.

ACCESSIBILITY/TRANSPORTATION

Major Findings

- Flexible scheduling was the highest-rated objective in this category (M=3.8).
- Providing accessibility to the university via transportation systems received a high rating (M=3.7), from which panelists suggested that this objective was key to integrating students into the community.
- The benefits of distance learning practices were disputed between panelists, as evidenced by the moderate mean rating of 3.3.

Table 30. Means & Standard Deviations of Panel Ratings Regarding the Accessibility/Transportation Objectives

Objective	M	SD
Offer classes in a variety of timeslots to permit flexible scheduling by students.	**3.8**	0.39
Ensure transportation link with local area metro system for increased access to campus.	**3.7**	0.49
Offer classes in subsequent semesters to allow for student flexibility in scheduling.	**3.6**	0.67
Offer classes on weekends and special Friday-Saturday combinations.	**3.5**	0.80
Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on -campus classes.	**3.3**	0.75
Grand Mean	**3.6**	**0.65**

Discussion

As can be seen in Table 30, the use of flexible scheduling patterns, such as offering course sections in a number of different time slots, was the highest-rated objective in this category (M=3.8). However, like other objectives within this category, it did not elicit much commentary from the panel. In fact, the only comment added was, "Good idea—we have run into problems, mostly logistical."

Commentary regarding the transportation link with the local area metro system was also rated high, and one panelist suggested that it was an important part of integrating students into the "community of learners." Another panelist found in her own study that this issue was very important for commuter campuses and disabled students. In particular, she noted that there was a serious misfit between bus services and class schedules.

Although listed as an important objective, comments from the panel regarding offering classes in subsequent semesters (M=3.6) suggest that the issue is more about the ability of faculty to properly advise students rather than alter scheduling. One panelist said that course selection across semesters was a very serious problem for students, "added to by erroneous faculty advice." Another panelists simply added, "Not necessary if advising is good." A logistical comment added another element of difficulty: "I only have so many faculty. So many rooms for lecture or labs."

The issue of offering classes on weekends and special Friday-Saturday combinations received a moderate mean rating from the panel (M=3.5). The comments from the panel were divided along faculty-student lines. One panelist focused on the faculty side of the issue, by commenting that the institution would have to rethink its faculty commitments and "commitments to personal and material life." However, another panelist looked at this issue purely from the student's viewpoint in suggesting that this was an important objective to mature students, working students, and single parents.

In light of the recent increases in the use of distance learning technologies, the low mean response from the panel was somewhat of a surprise (M=3.3). Several panelists were cautious in their support of distance technologies as an answer to logistical problems. One panelist responded that there is a need for more work describing the effective of the technologies, instructional strategies, and faculty professional development. Additionally, the problem of faculty resistance is another potential barrier to the proper use of distance education, replied another panelist. Distance learning was also described as a tool that is not equitable to the needs of students: "Distance learning is not good for academically challenged students who thrive on personalized contact. Good for advanced students."

HOUSING

Major Findings

- The affordability of on-campus housing and meals was the highest-rated objective of this category (M=3.7).
- On-campus housing for students received a mean rating of 3.6 from the panel, and it was noted that this is especially important for the increased student population with families.
- Panelists gave housing patterns a below average rating (M=3.1) and cited possible issues of segregation and tracking as potential implications.

Table 31. Means & Standard Deviations of Panel Ratings Regarding the Housing Objectives

Objective	M	SD
Ensure affordability of housing and meal plans.	**3.7**	0.48
Encourage on-campus housing for students.	**3.6**	0.65
Provide an appropriate number of housing slots to meet the needs of the student body.	**3.5**	0.66
Develop housing patterns that may incorporate choice of major or other demographic issues.	**3.1**	1.08
Grand Mean	**3.5**	**0.76**

Discussion

There was not much conjecture concerning the issue regarding affordability of on-campus room and board among the panel, as can be seen by the high mean rating of 3.7 for that particular objective (See Table 31). One panelist mentioned that many minority students received full assistance anyway, so he did not see the affordability of room and board as a major issue regarding persistence.

There was a mixed reaction on the panel regarding encouraging on-campus housing for students (M=3.6). The original objective was added as a result of research findings stating that on-campus housing was an important component of the social integration process for students. In fact, one panelist identified the studies of Astin, Boyer, Fleming, Nettles, and Morris et al in support of this objective. Another panelist concurred by suggesting that this objective was "critical during the freshman/sophomore years." However, other panelists were not allied with this objective, offering that the aging college population and students with children have redefined the college experience for many students. In terms of providing appropriate numbers of housing slots on campus (M=3.5), one panelist added that more family housing was needed for graduate students on campus.

Developing housing patterns among students based upon a number of variables, including possibly cultural or academic divisions, was not strongly supported by the panel (M=3.1). The panel felt that the issue housing patterns was too broad and needed to be broken down. Other panelists suggested that this was a form of "tracking" and could promote segregation. However, the panelist who offered the latter comment also noted that it is a concern that is generally raised by non-minorities.

Of the additions provided for this category, one panelist suggested that academic support services could be conducted within housing units to encourage use by students.

COUNSELING

Major Findings

- Three objectives within this category received mean ratings of 3.8, suggesting that colleges provide psychological, social, and career counseling to students with sensitivity toward cultural and racial issues.
- Panelists commented that providing counseling services sensitive to cultural and racial issues was perhaps the most important function of minority program officers.
- Making available a variety of counseling techniques was described by the panel as a possible barrier to students in deciding which resource to use for what purpose.

Table 32. Means & Standard Deviations of Panel Ratings Regarding the Counseling Objectives

Objective	M	SD
Provide psychological and social counseling to students to support added stresses in society.	3.8	0.44
Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal.	3.8	0.44
Provide counseling services that are cognizant of the cultural and racial issues facing students.	3.8	0.44
Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs.	3.4	0.96
Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions.	3.3	0.98
Grand Mean	**3.6**	**0.7**

Discussion

Table 32 illustrates the equal distribution of ratings from the panel regarding the first three objectives (M=3.8; SD=0.44). The provision of psychological and social counseling to students, the use of career counseling, and the necessary sensitivity of counselors toward racial and cultural issues were highly rated by the panel. In terms of the first objective, one panelist advised that the objective should not stop with just added stresses, "but include new roles and responsibilities" as well. Other comments described the importance of service delivery to students. In particular, one panel member suggested that students wanted a "one-stop service" for their needs, a sign of today's society.

While panelists thought that career counseling was a very important issue for students, it was suggested that most career counseling is "far too late" in the students academic career, and that pre-college institutions and counselors must be up-to-date on the reality of the work force. One panelist thought that this was a strong role for advisors and mentors at the college level rather than counselors.

There was no disagreement among the panel regarding counseling services cognizant of cultural and racial issues were positive. Panelists exclaimed "Absolutely essential!!!" and "Very important" in their support. In particular, one panelist suggested that this may be one of the most important functions of minority program officers.

Although the development of appropriate publications did not elicit substantial commentary from the panel. Panel feedback did include the suggestion that a handbook of services was an important feature of a campus.

Finally, the only point of contention within this category regarded the use of a variety of counseling techniques for students. As one panelist described, students now "complain that they can't find which resource to go to for what purpose." Therefore, careful planning would have to take place to ensure a cohesive menu of opportunities for students.

SUMMARY OF ROUND ONE FRAMEWORK

In sum, the five components of the framework were highly supported by the panel. As expected, not all categories or objectives within each component received the same level of support, but in general terms, the framework was well received. Table 33 presents data that allows us to make comparisons across the framework. The second and third columns present the grand mean figures and standard deviations for each of the five components. The grand mean figures represent the average of all objective ratings within each component. The final column presents the frequency of 'most important' responses from the panel for each component. For example, Table 33 informs us that Financial Aid generated a grand mean rating of 3.2, a standard deviation of 0.99, and a frequency of 56 percent responses at the 'most important' rating level. What Table 33 manages to show us is the relative perceptions of the panel to each component of the framework (NOTE: a higher grand mean rating in the table does not necessarily suggest with a higher level of relative importance, but only that the individual objectives within a component received higher ratings than others).

The most highly-rated component of the framework was that of Academic Services (GM=3.7). The combination of a low standard deviation (0.62) and high percent of panel support (74 percent 'most important') illustrate a cohesive pattern of support among the panel. Recruitment and Admission, Curriculum and Instruction, and Student Services received approximately two-thirds of the support from panelists at the 'most important' level, as evidenced by frequency ratings of 66, 66, and 68 percent respectively. Financial Aid was the only component that received below average ratings, yielding only a 3.2 grand mean rating and a higher variance of responses (SD=0.99).

Table 33. Grand Means and Percentage of "Most Important" ratings for Individual Framework Sections

Section	Grand Mean Rating	Standard Deviation	% of 'Most Important' Ratings
Financial Aid	3.3	0.99	56
Recruitment and Admissions	3.5	0.75	66
Academic Services	3.7	0.62	74
Curriculum and Instruction	3.6	0.64	66
Student Services	3.6	0.67	68

Retention Program Development

The Round-One instrument also contained a component dealing with the organizational and implementation issues related to retention program development. Six areas were developed for this area, including a listing of program benchmarks, four stages of development, and the discussion of an organizational management system.

RETENTION PROGRAM BENCHMARKS

The feedback regarding benchmarks of a student retention program was generally quite positive. In fact, the lowest rated item still managed to score a respectable 3.3 points on the four-point Likert-like scale (See Table 34). Of the top five benchmarks, the panel identified three items which are consistent with the need to "institutionalize" the retention process: (a) institutionalization of the program, (b) not based on soft money, and (c) involve the entire campus. Additionally, the other two top-five spots incorporated the need to focus on student needs. Throughout the Delphi process, panelists consistently remarked on the need to focus on the student.

Table 34. Means & Standard Deviations of Panel Ratings Regarding the Retention Program Development Benchmarks

Benchmarks	M	SD
1. Be institutionalized and become a regular part of campus service	3.9	0.28
2. Be student-centered	3.8	0.39
3. Be sensitive to student needs and to diverse populations	3.8	0.44
4. Be cost effective, and not reliant on soft moneys	3.8	0.45
5. Involve all campus departments and all campus personnel	3.6	0.51
6. Provide extensive and appropriate retraining of staff	3.6	0.65
7. Suit the particular needs of the campus	3.5	0.66
8. Be supported by a comprehensive student monitoring system that will become the foundation of all institutional research on campus and support every department	3.5	1.00
9. Be based on proven research	3.3	0.95
10. Take into consideration the dynamics of the change process	3.3	0.79

Other comments from panelists included the need for the administration to "mandate" the program for greatest impact and be inclusive of student empowerment.

STAGE 1 - PRE-PLANNING

The panel rated five benchmarks related to the retention program pre-planning stage (See Table 35). As with the retention program benchmarks illustrated above, these too were highly rated by the panel. The highest rating went to the identification of student needs (M=3.9), with analysis of student retention issues (M=3.8), effectiveness of current strategies (M=3.8), and the identification of potentially useful institutional resources (M=3.8) following close behind.

One panel member reminded that it is imperative for the planners to know who the student population is, why they enter or leave, and what the attrition/retention rates are at any given point. Another panel member added this equally important point: "What works at one campus will not necessarily give the same results at another campus, unless the institutional characteristics are the same. Retention should be customized to the respective institution." It was also suggested that the identification of institutional resources also include the development of resources as required.

Table 35. Means & Standard Deviations of Panel Ratings Regarding the Pre-Planning Stage Benchmarks

Benchmarks	M	SD
1. Identify student needs on campus	3.9	0.29
2. Assess the status and effectiveness of current retention strategies and programs on campus	3.8	0.38
3. Identify institutional resources that may be utilized or redirected	3.8	0.38
4. Analyze the size and scope of retention issue on campus	3.8	0.39
5. Identify successful retention strategies at other campuses	3.5	0.66

STAGE 2 - PLANNING

Although five of the six planning stage benchmarks received high mean ratings from the panel (See Table 36), four of the thirteen panel members felt that this area was either not clear or too vague to be entirely useful. The only specific comment that was issued regarded the revision of the college's mission statement. The panel member stated that missions or goals should not be redesigned to fit the plan, but rather the plan should fit the mission and goals of the institution.

Table 36. Means & Standard Deviations of Planning Stage Benchmarks

Benchmarks	M	SD
1. Development of implementation plan	3.8	0.38
2. The development of retention program components and operation strategies	3.7	0.48
3. The development of organizational strategies	3.7	0.49
4. The identification of key stakeholders on/off campus and their roles within the retention process	3.7	0.49
5. The assessment, presentation, and discussion of Pre-Planning data	3.7	0.65
6. The refinement or enhancement of the college mission statement and goals	2.8	1.03

STAGE 3 - IMPLEMENTATION

This section of the framework only solicited four remarks from the panel. Two of these remarks focused on the need to involve people who are dedicated and "have a passion for assisting students" at the forefront of the implementation process. It was offered that faculty dedication is key to program success. Other comments echoed earlier benchmarks: Institution-wide involvement, incentives and awards, and the need for measurable objectives. One panelist also suggested that the college needed to ensure long-term financial commitments.

STAGE 4 - PROGRAM MONITORING

The panel was given only three objectives to choose from in Stage 4, all of which received high mean ratings and low standard deviations (See Table 37). Although the collection of data for program and student evaluation was ranked highest of objectives within Stage 4 (M=3.8), one panelist warned that "any serious practitioner will tell you about the politics of data in this volatile arena," suggesting that an institution must be careful with how numbers are used to prove or disprove programs. Another panel member expanded benchmark number three by suggesting that dissemination cover feedback to faculty regarding the effectiveness of their teaching strategies, the monitoring of curriculum changes, the effectiveness of faculty and staff incentives, and the hiring practices of minority faculty members. A key comment in this section, again regarding the third benchmark, suggested that the key stakeholders should be involved in determining what items should be monitored.

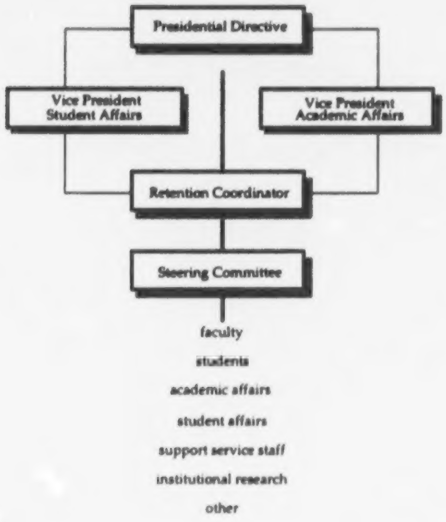
Table 37. Means & Standard Deviations of Program Monitoring Stage Benchmarks

Benchmarks	M	SD
1. Data collection and analysis of program components and student performance	3.8	0.38
2. Ensure that conclusions based on program monitoring are incorporated in program revisions	3.8	0.44
3. Dissemination of data to stakeholders	3.5	0.69

ORGANIZATIONAL PATTERNS

The remarks regarding the organization/management chart that was included with the first-round instrument only solicited responses from 6 of the 13 panelists, making it difficult to identify any clear trend in the response patterns. However, although the response may not be statistically significant, it is nonetheless interesting to note that the responses that were offered were generally not positive. This is interesting mostly because the model included in round one (See Table 38) was extracted from a major student retention document by Beal and Noel (1980). Although this document was seen as a major piece of work in the area of student retention, the panel members in this study clearly do not agree with this pattern 15 years later. One panelist urged: "Universities are not business. Check out Change Magazine for the failure of TQM, CQI, PQR, etc., in higher education. You need a model that is congruent with the true functioning of the beast you're trying to reform." Another panelist wondered why the chart was so linear. Others suggested that administrative services be added to the hierarchy, and that institutional planning and research be moved much closer to the top.

Table 38. Beal and Noel's Organisational Chart for Student Retention


Presidential Directive
Vice President Student Affairs
Vice President Academic Affairs
Retention Coordinator
Steering Committee
faculty
students
academic affairs
student affairs
support service staff
institutional research
other

RETENTION PROGRAM DEVELOPMENT SUMMARY

Most of the objectives or benchmarks identified in this section were given moderate or high ratings from the panel. The first five areas in this section define certain criteria that must be considered in the development and implementation of an effective student retention program.

The discussion and findings regarding organizational management did not bring any clarity to the issue of management structure for this type of framework. Therefore, findings from this particular section must be considered insignificant.

ROUND TWO FINDINGS

Round two was limited to two specific tasks: (a) rating new objectives added to the framework based on first-round comments by the panel, and (b) reaffirming the status or importance of particular objectives first introduced in round one. The areas of

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program development and implementation were left out of the second round to add focus to the issue of specific objectives related to a student retention program.

In terms of the first task, the panel was simply asked to complete the Likert-like scale for each new objective, similar to their task in round one. The data collected was then added to the original spreadsheet, from which the objectives were recalculated and sorted due to their mean response rating. This data then formed the order of objectives presented in the final framework found in Chapter Five.

The second task of round two, the identification of critical objectives to each framework component, was perhaps the most interesting part of the second round. Panelists were asked to identify, in order of importance, the three most significant objectives for each of component of the framework. The data collected was calculated through a simple formula which gave each first-ranked item a '3' point rating, second-ranked items '2' points, and third-ranked items '1' point. The sum of these calculations resulted in a final number which was used to represent the final ranking of objectives. The following section discusses the findings associated with this component of the round-two instrument.

FINANCIAL AID

The task of identifying and informing students and families of grant/scholarship availability was rated the most significant objective under the financial aid heading (See Table 39). Five of twelve panel members rated this objective 'most important,' with only one other panelist rating it second. The second and third objectives related to the opportunities for students through work studies and grants/scholarships. While work studies was rated second, it did manage to elicit a total of eight votes—tied for the most top-three responses of any objective within this study. "Frontloading grants and scholarships..." was rated fifth, but that rating was only dependent upon two votes in total. The issue of frontloading was criticized by several panelists during round one, many complaining that students need more money when their studies get more formidable toward the end of their degree. However, it still managed to make the top five objectives within this component.

Table 39. Top Five Financial Aid Objectives

Ranking	Objective
1	Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.
2	Increase availability of assistantships and work study programs for undergraduate and graduate students.
3	Maximize availability of Grants and Scholarships compared with Student Loans
4	Inform students and families of all available options related to the financing of college
5	Frontload grants and scholarships to provide more support in the early years of college

RECRUITMENT AND ADMISSIONS

Utilizing existing pre-college programs to enlist potential students was highly rated in round two, soliciting five first-place votes. However, the following two objectives, 'incorporating alternative assessment strategies' and 'using students as advocates,' managed to elicit 6 and 5 panel votes respectively. Living on campus and developing credit-based orientation courses/opportunities ranked fourth and fifth.

Table 40. Top Five Recruitment & Admissions Objectives

Ranking	Objective
1	Work with pre-college programs to identify potential recruits
2	Incorporate portfolios, interviews, and other non-cognitive assessments
3	Use work study and teacher prep students to make visitations to middle and high schools to recruit students, and inform students about the need for study skills, good academic preparation, and advantage of taking AP courses
4	Provide opportunities for pre-college students to live on campus
5	Create freshman orientations that are required and for credit

ACADEMIC SERVICES

Academic advising and counseling rated high with the panel. In round two, four panelists ranked it as the most important objective, which is no surprise considering that eleven panelists gave it a '4' rating during round one. The next three objectives identified by the panel received at least four votes. Faculty use of a variety of instructional methods was the second highest rated objective, while pre-college programs (elementary, secondary, and summer before freshman year) took the third and fourth spots. The encouragement of faculty to support academic needs of students outside of class was ranked fifth.

Table 41. Top Five Academic Services Objectives

Ranking	Objective
1	Provide academic advising and counseling for students on regular basis
2	Incorporate a variety of instructional methods to support student learning
3	Provide summer academic and social support for admitted students before the commencement of the freshman year
4	Develop pre-college programs at the elementary and secondary education levels
5	Encourage faculty to support the academic needs of students outside of class time

CURRICULUM AND INSTRUCTION

The last two components of the framework, "Curriculum and Instruction" and "Student Services," received the most top-three votes from the panel, which suggests a more convergent pattern regarding which objectives were most important. Of the top five objectives, the first two received seven votes. On top was the issue of developing interesting and motivating pedagogical techniques in the classroom/lecture hall, eliciting five first-place votes. Placing second was the ongoing curriculum review process, while instructional training for teaching faculty ranked third. Closing out the top five for Curriculum and Instruction were the establishment of an appropriate faculty reward system and the utilization of diverse approaches to student assessment.

Table 42. Top Five Curriculum & Instruction Objectives

Ranking	Objective
1	Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students
2	Develop an ongoing review process of curricula utilizing faculty input and outside consultation
3	Provide appropriate instructional training for teaching faculty
4	Develop an appropriate faculty reward system
5	Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.)

STUDENT SERVICES

Providing a pluralistic environment for students tied for the most top-three votes in this study, five of which were first place rankings. Establishing a variety of timeslot offerings for courses (specifically gatekeepers) ranked second, with an equal number of votes in the first, second, and third place categories. Career counseling and non-classroom faculty-student interaction both received eight points, while affordability of room and board carried enough support to keep it in the top five.

Table 43. Top Five Student Services Objectives

Ranking	Objective
1	Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula
2	Offer classes in a variety of timeslots to permit flexible scheduling by students
3	Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal
4	Provide non-classroom opportunities for faculty-student interaction
5	Ensure affordability of housing and meal plans

CHAPTER FIVE

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Although the number of minority students entering post-secondary education programs has steadily increased over the past several decades (Rodriguez and Nettles, 1993), the numbers of students within this population receiving bachelors degrees in science, engineering, and mathematics programs has either decreased, stagnated, or made marginal increases during this same time period (with the exception of Latino-Americans) (NSF, 1994). Compounding the problem is the poor rate of student persistence among minority students at four-year colleges. Several studies conducted during the past fifteen years have shown that only about half of minority students who enter college graduate within five years of matriculation, and African American and Hispanic students graduate at much lower rates (Beal and Noel, 1980; Lenning, Beal, and Sauer, 1980; U.S. Student Association, 1992; AASCU, 1994).

Goal Five of the Goals 2000: Educate America Act (Public Law 103-227, 103rd Congress, 1994) states that "the number of United States undergraduate and graduate students, especially women and minorities, who complete degrees in mathematics, science, and engineering will increase significantly" (GOALS 2000, 1994). However, in light of the studies cited above, it is difficult to imagine that Goal Five can be attained without significant intervention into the development of minority scientists, engineers, mathematicians, and technologists.

A majority of the studies conducted in the past twenty-five years regarding student retention have focused on the isolation of specific variables, such as counseling, instruction, campus culture, or student behaviors. Many of these studies have explored the effects of intervention programs aimed at curbing the attrition of students in undergraduate and graduate programs. Although these studies have led to many reforms in the development of student retention programs, these programs are generally mutually exclusive of other programs and activities on campus. Little effort has been placed on the development of a comprehensive student retention program from a campus-wide perspective—a perspective that requires the specific and unique elements of a campus to be explored and involved to best suit student needs.

The purpose of this study was to identify the program components and implementation strategies that would form an institution-wide student retention model for minority institutions, with specific focus on science, engineering, and mathematics (SEM) areas. During the identification process, four sub-questions were also developed to support the main purpose. These questions included:

- What are the significant factors related to student attrition and retention at minority institutions?
- What types of programs have been successful in increasing retention rates at four-year institutions, minority institutions, and in SEM areas?
- What are the key elements to be considered in the development and implementation of an institution-wide retention program?
- What policies are needed to support the development and implementation of an institution-wide student retention program?

A Delphi technique was used to collect data from a panel of 16 experts in fields pertaining to this study. The instrument administered to the panel consisted of a two-round process: the first round formed the foundation of the study by allowing panelists to comment on a conceptual framework based upon a broad review of pertinent literature; the second round focused on ranking the importance of specific components of the framework. The findings related to these instruments were presented in Chapter Four.

The purpose of this chapter is to present and discuss the results of the study relating to the research questions. In particular, the chapter is divided into two sections: Overview and Discussion, and Conclusions and Recommendations. The Overview and Discussion section focuses on the significant details of the framework and the policy implications related to the development and implementation of a institution-wide student retention program. The Conclusions and Recommendations section offers directions for further study and practice.

OVERVIEW AND DISCUSSION

The literature review preceding this study identified variables and strategies regarding two areas important to the development of a student retention program. The first areas incorporated research related to the organization and management of a retention program. The second area concerned the development of a framework of strategies or components which promoted student persistence. During the two Delphi rounds, panelists rated and commented on both of these issues, further shaping the final framework and implementation plan presented in Chapter Four. The following section will focus on the policy issues relating to the organization for program development and the final retention program framework.

BENCHMARKS FOR PROGRAM DEVELOPMENT AND IMPLEMENTATION

The development and implementation of a comprehensive student retention program requires that faculty and staff acknowledge and adhere to a common set of "benchmarks" or "norms." These benchmarks ensure that certain standards and considerations are adhered to during program development. Through both the literature review and Delphi panel responses, a set of benchmarks regarding the development and management of a student retention program were identified. The ten benchmarks that follow will help secure a foundation that fosters campus ownership, the development of appropriate interventions and practices, and identifies the student as the focus of all institution efforts.

1. INSTITUTIONALIZE ALL RETENTION PROGRAM EFFORTS IN ORDER TO MAKE THEM A PART OF REGULAR OPERATIONS

The panel strongly supported the institutionalization of program operations. Clewell and Ficklen (1986) are among the researchers who suggest that institutionalization is an important part of program development. By institutionalization, it is meant that program operations must become mandated and supported by the campus administration and ultimately become standard campus practice. This requires that financial resources are earmarked for program operations, and that campus personnel are cognizant of and users of the programs.

2. FOCUS ON THE STUDENT

A student retention program should place the needs of the student at the center of all operations and planning. The complicated nature of the four-year institution makes it possible to place other organizational or politically motivated needs at the focus of program development, but as Tinto (1993) suggests, other factors may allow the direction of the program to go out of focus. Program managers and stakeholders must take special effort to ensure that student needs are always the pinnacle of consideration.

3. OPERATE IN A COST EFFECTIVE MANNER AND RELY ON APPROPRIATED FUNDS

The institutionalization of a retention program is dependent upon the allocation of funding and the expectation that funding will be continued. Programs that are dependent upon grant money often are too sensitive to political and economic pressures from the private and government sectors. Therefore, the goal of retention programs should be the institutionalization of program funding into the operations budget of the college or university. Additionally, current cutbacks in government funding force institutions to run their programs in a cost-effective method, utilizing all funding in an appropriate and efficient way.

4. BE SENSITIVE TO THE NEEDS OF A DIVERSE STUDENT BODY

The panel supported research that suggested the importance, especially for Historically Black Colleges and Universities (HBCUs) and other minority campuses, of placing diversity and campus culture at the forefront of program consideration. HBCUs have long been noted for their social community and support of students (Payne, 1994), and research has shown that a culture of warmth, trust, and multicultural experience supports student persistence and social integration (Astin, 1993; Justiz, 1994; Sawchuk, 1991). Program developers should encourage and establish diversity as a common element in all operations, ensuring that all students have equal opportunity, access, and representation.

5. INVOLVE ALL CAMPUS DEPARTMENTS AND PERSONNEL

The alienation of campus groups, departments, or individuals can result in the failure of any implementation effort. Involvement of key stakeholders from all facets of the organization is essential to ultimate success. Smith and Sprandel (1985) noted the importance of involvement and "community" in retention program development and operation, and the panel also acknowledge this important benchmark. However, this involvement also necessitates careful planning by program managers, who must coordinate the involvement of all faculty members, departments, staff, and other personnel (including students and families). It should be expected that the central management group (or department) that will be coordinating this program may require additional funding to properly staff the department and provide support that promotes campus interconnectivity.

6. PROVIDE EXTENSIVE PROFESSIONAL DEVELOPMENT OPPORTUNITIES

The importance of professional development opportunities for faculty and staff with regard to retention programming is a critical issue in the success of the program, as was suggested by several studies (Tinto, 1993; Clewell and Ficklen, 1986; Noel, Levitze, Saluri and Associates, 1985) and supported by the panel. The administration or development team must incorporate the financial and human resources to ensure that staff have the capacity to provide retention support to students. This, in turn, will illustrate the support and leverage of campus administration. The multiplicity of program operations involved in a campus-wide retention program requires that professional development be placed among the highest priorities for campus involvement.

7. SUIT THE PARTICULAR NEEDS OF THE CAMPUS

All campuses are unique entities, separate in nature from other campuses sharing similar attributes. Noel et al. (1985) stressed the importance of conducting an institutional self-assessment of resources and practices before formal development commences. Institutions must parlay this as a "given" in any fundamental change to program operations, as it is unrealistic to assume that any organization can make valid improvements without knowledge of the nature of the campus and the efficiency/success of current programs. This is especially an important consideration when institutions attempt to replicate programs that have proven successful at other institutions. Developers must take into consideration the variables on the successful campuses and relate them to the specific variables on their campus. Therefore, a comprehensive understanding of the campus is required for planning.

8. UTILIZE A COMPREHENSIVE MONITORING SYSTEM FOR PROGRAM AND STUDENT MONITORING

It is difficult to apply academic and social interventions when information regarding individual student achievement and program effect is unavailable or untimely. In order to intervene in student practice before it is too late, practitioners require up-to-date student data on a continual and "need-to-know" basis. Quite often, mid-terms are the first time instructors have any feedback regarding student achievement and program effect. Therefore, a comprehensive system of student/program evaluation and assessment is required to collect data that can allow practitioners to: (a) develop more suitable methods of programming and evaluation, and (b) alter current programs within a particular semester to meet the timely needs of students. A campus-wide computer network capable of constant updating of student and program information and for retrieval of data is an essential part of this plan.

9. BE BASED UPON CURRENT RETENTION RESEARCH AND LITERATURE

Program efforts should be based upon previous research and applied to meet the particular needs of the campus. In addition, practitioners and administrators should routinely review literature to improve programming practices and options. Research may also consist of on-campus research regarding programs and practices. A campus must ensure that data collection and analytical procedures are conducted effectively and accurately, and that results are delivered back to classroom instructors.

10. TAKE INTO CONSIDERATION THE DYNAMICS OF THE CHANGE PROCESS

The human dynamics that are part of any institutional change must be given serious consideration and focus by campus administrators. People, because they develop a sense of comfort with the day-to-day operations of an organization, may be adverse to any action that may destroy that comfortability. Therefore, developers must: (a) be cognizant of the sociological considerations regarding organizational change; and (b) identify and implement program management strategies that can support the specific needs of the faculty and staff. Ultimately, program developers and managers must weigh the cost of implementation frustration and chaos with potential program outcomes to determine the political reality of implementation.

FOUR STAGES OF RETENTION PROGRAM DEVELOPMENT

From the literature review, four stages regarding the planning and implementation process for a student retention program were identified. The panel assisted in developing a hierarchy of importance for the issues related to each stage.

STAGE 1 - PRE-PLANNING

The major component of the pre-planning stage is to collect information which will paint a picture indicative of the campus and student population. Panel members in the study concurred with research by Cooper et al. (1992), Noel et al. (1985), and others which place the integration of campus research and planning as paramount activities in the development of a successful retention program. Program planners must be prepared to conduct needs assessments of current campus operations, from curriculum practices to housing operations. If an institution has a respectable institutional research operation, these areas are continuously being explored and monitored. However, for campuses without the technical or human resources for this task, the implementation of such methods should be a primary consideration. In particular, five areas were identified and validated in this study that are important considerations to program developers:

1. IDENTIFY STUDENT NEEDS OF CAMPUS

   Each campus has a unique student population that is unlike any other study body across the nation. The students have particular reasons for attending a specific campus. As well, students have a history which they bring with them to the campus that impacts upon their academic success. In order to provide appropriate services to students, the institution must become knowledgeable about the entering students and their needs. High school data, interviews, focus groups, and surveys are some methods and resources that can be used to obtain an understanding of who the campus is servicing. This information, in turn, is crucial to identifying what programs, practices, and interventions should be considered or revised on campus.

2. ANALYZE THE SIZE AND SCOPE OF RETENTION ISSUES ON CAMPUS

Institutions must collect and analyze data regarding student persistence and attrition. When are students dropping out? What courses have traditionally high rates of drop out or incompletion? These are the types of questions that must be answered and recognized by program developers. The college's institutional research department should be involved in the planning process to assist with the collection and analysis. If the data is not currently being collected, systems must be implemented to allow for this important data compilation.

3. ASSESS THE STATUS AND EFFECTIVENESS OF CURRENT RETENTION STRATEGIES AND PROGRAMS ON CAMPUS

Proper planning for retention should involve an assessment of current programming and practice. From this information, developers can see what types of programming and practice have proven useful and which have not. Current programs may be expanded, others eliminated, and areas where no programming exists can be implemented. However, without a full-scale assessment of current activity and effectiveness, it is difficult to envision future needs.

4. IDENTIFY INSTITUTIONAL RESOURCES THAT MAY BE UTILIZED OR REDIRECTED

A needs assessment, such as one described above for assessing current retention programming, can also assist developers in identifying institutional resources that can be used or redirected for program use. These resources may be human, financial, or material. A needs assessment may find that some resources are out of sync with the current needs of the campus, and therefore can be redistributed to a more efficient use.

5. IDENTIFY SUCCESSFUL RETENTION STRATEGIES AT OTHER CAMPUSES.

   Program developers should keep a keen eye on retention efforts at other campuses. This practice can help developers identify potentially successful programs for their own use, and may also warn of programs that do not work. In conducting these ongoing reviews, researchers should no only focus on institutions like their own, but also look at what other institutions with different characteristics are doing in student retention.

Planners must have a very clear picture of what the issues are on campus. Although this may seem to be an obvious consideration, the implication of this knowledge has ramifications on the effectiveness of any program operation. Campuses must ensure that the unique nature of the campus is an important consideration in the development of any plan. It is for this reason that the plan illustrated in this chapter is called a "framework" rather than a model. All objectives and goals must be reworked to address the specific needs of the campus. Otherwise, the implementation of an inflexible model will become burdensome and fall short of expectations.

STAGE 2 - PLANNING STAGE

The planning stage should bring together the work conducted in pre-planning to build a plan, both politically and logistically, that reflects campus needs. Key stakeholders must be identified and invited to participate, and should reflect the composition of the entire campus. Smith, Lippett, and Sprandel (1985) suggested that it is important that institutions of higher education look at the vertical and horizontal set of relations on campus in organizing change. Persons should be included that represent each strata of the institution, which may include the trustee level, administrative level, and the faculty level. Additionally, connections should also be made horizontally, which looks at relations between departments, administrations, and student organizations, as an example. This practice can help ensure that all connections are identified during planning, and that political and practical considerations are made.

STAGE 3 - IMPLEMENTATION

The implementation process essentially must follow the prescription of the planning team in Stage 2. However, effective implementation is dependent upon the support from administration. The leadership, direction, and support from campus officials is necessary to send a message across to faculty and staff that the new retention programs are important and are being supported (Wolverton and Richardson, 1992).

STAGE 4 - PROGRAM MONITORING

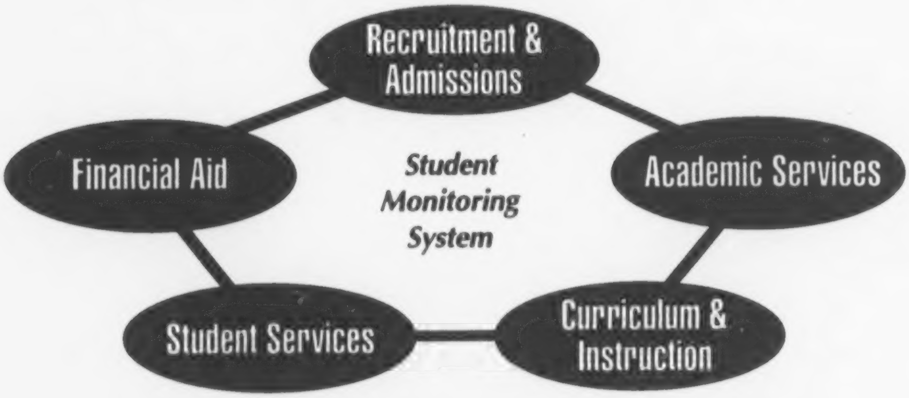
The data collection and assessment that was conceptualized in Stage 1 becomes an important practice in Stage 4. Proper program implementation requires that institutions and departments monitor the implementation process to ensure that the program is being implemented according to plan. An important caveat of this practice is the ability to quickly reassess program strategies based upon unrecognized needs that come up during the implementation process. This allows for fine tuning during implementation. Additionally, such monitoring should become a standard practice of all programs, and data should be collected which can be analyzed to assess program components and student achievement. The conclusions generated from this data must then be part of a cyclical process of program revision and fine-tuning for administrators and practitioners.

FRAMEWORK DESIGN

The retention framework presented in Chapter Four is classified into five components based upon an extensive review of current literature (See Figure 7). Four of the five components, Financial Aid, Recruitment & Admissions, Academic Services, and Student Services, are generally major departments in most four-year institutions. The fifth component, Curriculum & Instruction, is receiving more attention and consideration at colleges, and was added to this study because of the direct impact it has on student retention.

The framework components are further broken down into categories that provide areas of specialization. An example under the component of Financial Aid would be the category of Grants and Scholarships. Further, each category is then broken down into specific objectives. During this research study, the Delphi panel either validated or detracted from the objectives offered to them in the conceptual framework, as well as suggested new or revised versions of objectives.

Figure 7. Five Classifications for Campus-Wide Student Retention



An important consideration for practitioners is the relationship of the framework components to each other. As stated in the benchmarks discussion, a campus-wide effort is a requirement of an effective campus-wide retention program (Noel et al., 1985; Smith and Sprandel, 1985). The ability of campus departments to work together toward common goals and to focus on student needs is ultimately as important as any specific objective. From a organizational perspective, it is difficult to imagine how each component could work effectively without the linkage of other areas. For instance, Financial Aid departments often work very closely with Recruitment and Admissions, while Academic Services and Curriculum & Instruction are obvious composites. This framework attempts to develop additional linkages, such as those between Student Services and Academic Services, where the notion of Tinto's theory of academic and social integration (1975) is most relevant. The linkage of recruitment practices with pre-college academic support programs is a good example of how a campus-wide support network can help students persist toward graduation. The interrelation of each of the five components within the framework should be a major consideration to practitioners and developers.

As viewed in Figure 7, the five areas are bridged by a student monitoring system. The system, as identified from literature and panel discussion as an important benchmark, is a resource that helps to develop the linkage just discussed. Such a system, when developed to capture data which reflects the true details of student and faculty life on campus, provides an institution with a snapshot of students in terms of academic and social development (Tinto, 1993). It is with this knowledge that campus departments and personnel can generate more appropriate methods of supporting student needs.

The discussion that follows will focus on the five components identified in Figure 7. The purpose of the discussion is to provide both summary and conclusion with regard to each component based upon an analysis of the findings presented in Chapter Four. Discussion for each component will follow this format:

(1) Description — a brief presentation of the organization, content, and background for each component, as defined initially from the literature and then validated and refined by the Delphi panel based upon their knowledge and experience.

Further details regarding the framework design can be found in Chapter Four and in the Appendix section of this study.

(2) Major Issues — a brief discussion of the specific objectives rated highest by the panel during the second Delphi round. Comments focus on the rationale for each issue in addition to conditions or practices which should be considered by practitioners.

(3) Policy Implications/Considerations — a discussion of issues within the framework that require the particular attention of policymakers and practitioners involved in the development of a student retention program.

COMPONENT ONE: FINANCIAL AID

DESCRIPTION

Four categories were used to describe financial aid (See Figure 8). The use of grants and scholarships, student loans, financial counseling, and assistantships/work study programs were all identified in the literature and supported by the panel to be important factors in student retention. Although research has shown that grants are a much better predictor of student persistence compared to loans (Astin, 1982), the finite limitations on grant/scholarship availability suggest that loans and work studies must remain open avenues upon which students can gain access into the nation's post-secondary institutions. However, the provision of relevant and important information to students and families regarding selection criteria and availability remains an important consideration.

Loans, although not positively correlated to student persistence (especially for African Americans, Thomas, 1986), are often the only available option for many students. Thus, it is important that institutions carefully devise an equitable and supportive loan operation for students and families. The delivery of accurate and easy-to-follow information regarding loan availability and regulations is an important factor for families. In addition, the process for application must also be designed such that it does not deter families from completing applications (Astin, 1982; Collison, 1988). Students should also be able to access 'emergency' loans for specific situations while enrolled in college. Such considerations may include the need to buy books, health care, or travel money.

Figure 8. Financial Aid Framework Component

Financial Aid

1.1 Grants & Scholarships

1.1.1 Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.
1.1.2 Maximize availability of Grants and Scholarships compared with Student Loans.
1.1.3 Frontload grants and scholarships to provide more support in the early years of college.

1.2 Loans

1.2.1 Provide emergency loans to students in need
1.2.2 Inform students & family members of availability and responsibilities related to Loans.
1.2.3 Streamline bureaucracy & forms to simplify the application process.
1.2.4 Frontload loan payments to provide more support in the early years of college.

1.3 Assistantships & Work Studies

1.3.1 Increase availability of assistantships and work study programs for undergraduate and graduate students.
1.3.2 Increase faculty participation with regard to student assistantships.
1.3.3 Keep assistantships and work studies under 25 hours per week for full-time students.
1.3.4 Create Assistantships with towns, metropolitan areas, or businesses that provide a mechanism for work after graduation at loan forgiveness
1.3.5 Develop partnerships with local area business to forge work and research opportunities for students.
1.3.6 Attempt to design assistantships and work study programs on or close to campus.

1.4 Financial Counseling

1.4.1 Inform students and families of all available options related to the financing of college.
1.4.2 Train financial counselors to be sensitive to issues related to race and ethnicity.
1.4.3 Provide money management training to students and families.

Assistantships and work studies are an important part of a student's college education, especially for science majors. Astin (1975) found that work study programs could increase student persistence by 15 percent. These opportunities provide students with money, experience in the field, and perhaps most important, networking capabilities for future employment and research possibilities.

Financial counseling becomes the foundation for each of the three areas previously defined under the financial aid component. Counseling allows campuses to reach out to families and students and offer a variety of avenues to finance college attendance. Because the financing of college is one of the most important and costly endeavors that a family may make, it is important that financial aid departments are trained to deal with sensitive issues in a professional and supportive way.

MAJOR OBJECTIVES

1) INFORMATION DISSEMINATION

   Information must get to students and families before any other issue becomes relevant. The use of new technologies to deliver this information, such as computer networks and computer-interactive systems can help families plan for college and learn more about the college environment and requirements. Institutions must devise efficient and coherent communication paths to interested families in a method that is both informative and supportive.

2) INCREASE AVAILABILITY

   Colleges should attempt to revise current lending practices to increase availability of grants, scholarships, work studies, and loans to families. This availability is inextricably linked to the ability of institutions to identify possible recipients and communicate options to students and families. The revision of current national lending policies, although out of the realm of an individual college's control, may be a crucial area for college associations to focus on.

3) CONSIDERATION OF FRONTLOADING AID PACKAGES

Research has shown that frontloading student aid packages (i.e., coordinating financial disbursement so that students receive more money during the freshman year with diminished amounts in subsequent years) results in a more efficient use of loan money (GAO, 1995). Additionally, it broadens the capacity of the program to include a greater number of persons that may receive loan opportunities. The panel responses regarding frontloading practices were predominantly negative. However, panelists did give it an extremely high ranking with regard to its relative importance to other objectives. This suggests that although panelists may not agree conceptually with the frontloading process, they do see it as a viable option in a time of decreasing funding for college students.

POLICY IMPLICATIONS/CONSIDERATIONS

- INFORMATION ACCESS

The ability of colleges to remain at the cutting edge of financial aid policy and practice is dependent upon their ability to access information regarding funding policies from the various government departments. Campuses must either hire staff with qualified backgrounds in financial aid or provide comprehensive departmental training. The staff must be committed to providing an important service to the student population, and therefore must understand the need to be knowledgeable about financial aid policy and be able to transfer this policy to practice.

- COMMUNICATIONS PROCESSES

Colleges should develop the most efficient and productive methods of communicating with families. Panel comments included the incorporation of computer networks, such as the College Board's "Fund Finder," which help families establish their financial need as well as determine their eligibility for many of the scholarship, grant, and loan opportunities available. However, the personal nature of communication was seen as an important consideration for financial aid departments. Employees must be trained to communicate with parents and students in a supportive, understanding, and amiable fashion.

- ALTERNATIVE FINANCIAL AID PROGRAMS

Colleges must incorporate alternative or non-traditional financial aid packages to meet the needs of a diverse student population. The financial aid department should have a broad scope of possibilities for families to consider and make available all possible avenues of college entrance for students, especially for those with financial difficulty. Campuses may want to depart from the exclusive use of Federal financial aid programs and try and establish local methods of funding student attendance. The expansion of work-study programming and business linkages may support this need. The process of uncovering new ways for students to afford and attend college should be a continuing process for departments and a basic goal that guides practice.

- FINANCIAL MONITORING

Colleges may develop unobtrusive methods of monitoring student money usage through the use of on-campus counseling services for students. Issues of personal privacy must be considered in the type of monitoring that is conducted by departments, as was raised by the panel. Regardless, institutions must be able to justify who receives financial aid, whether it is being used appropriately, and which students still face financial crises after receiving aid. Current systems of financial aid monitoring, however bureaucratic and time consuming, fail to answer any of these questions.

- PARTNERSHIPS/AGREEMENTS

Colleges should encourage and support the development of partnerships with business, industry, and research groups that would provide a direct link between classroom theory and real-world practice. Panelists pointed out the particular importance of this to engineering schools. However, not all colleges are located in areas that have local access to an industrialized sector, as are most urban colleges. In these situations, faculty and administration must become more creative in how they develop practical application for their SEM majors. Currently, several minority-serving colleges have developed working relationships with national labs, such as the Jet Propulsion Lab, Sandia National Laboratory, and the Lawrence Berkeley Laboratory.

- FACULTY INVOLVEMENT

Colleges should design policies that encourage faculty to involve students in research projects or to link students with outside researchers and business.

The panelists supported current literature suggesting that faculty involvement was a major factor in the retention of students in the sciences. Role modeling, mentoring, and monitoring of student activity are positive spin-offs of this involvement. However, how an institution creates and "frees-up" faculty for this type of work is a policy concern that directly relates to the mission of the university and the definition of faculty role. Issues such as reward structures and tenure must be revised or clarified.

COMPONENT TWO: RECRUITMENT AND ADMISSIONS

DESCRIPTION

The three categories under the classification of recruitment and admissions include student identification, admissions, and orientation (See Figure 9).

Tinto (1993) and others (Astin, 1975; Cope and Hannah, 1975) are among the researchers who discuss the importance of linking student goals/expectations to the institutional mission relative to student persistence. This being held true, the role of the Recruitment and Admissions departments must be clarified to: (a) first identify students whose career and educational goals are closely matched to the institutional mission; and (b) admit those students to the college. The objectives within the Recruitment and Admission component reflect this current view held by practitioners and researchers.

The findings of this study supported research suggesting that best methods for identifying students include: the recruitment of students who have been involved in pre-college programming conducted by the institution; promotional visits to local-area secondary schools; the development of outreach programs within the target area of the institution (geographically speaking); and the utilization and promotion of alumni clubs to recruit students.

Although the traditional practice of college admissions includes the evaluation of a student to see if they fit the 'mission' of the institution, colleges must accept the reciprocal responsibility of ensuring that the institution fits the needs of the student. Colleges should utilize a number of assessment/evaluation practices in the admissions department to get a clearer conception of student-institution congruence. Although SATs and other norm-referenced tests have become standard practice for admission, current questions regarding the validity and equity of these approaches substantiate the need to diversity the admissions process.

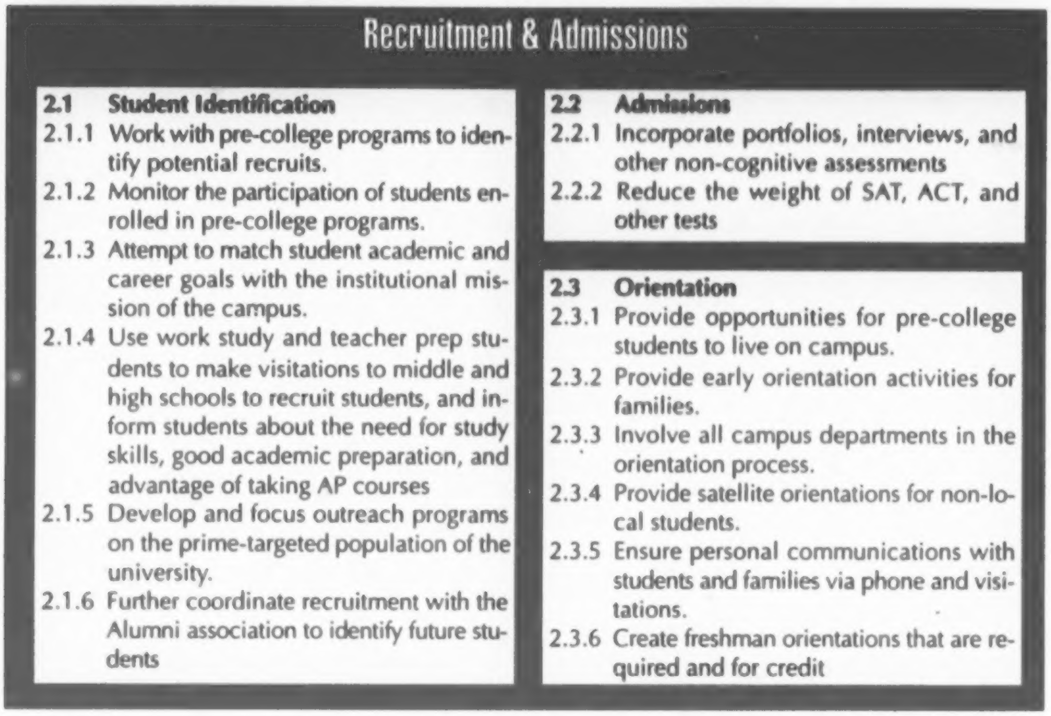
Finally, the orientation component of this area is an important part of student integration, both socially and academically, with the college. Orientations should look beyond the student and offer opportunities to families and significant others, as the college experience is truly an experience for the entire family and not just the person in attendance. The Lubin House experience at Syracuse University (Elam, 1989) remains an exemplary model of satellite orientation practice and should be studied carefully by prospective colleges. Additionally, on-site orientations and extensive communications with families should become standard practice of any college.

MAJOR OBJECTIVES

1) PRE-COLLEGE PROGRAMS

To ensure the efficiency of campus departments related to student recruitment, coordinators should capitalize on student data and involvement in pre-college programs offered by the institution. Students in these programs generally have already shown college aspiration, academic potential, and have been oriented to the college. Therefore, pre-college programs have a number of long-term benefits for the college, including the opportunity to assess student ability based upon these programs and having a built-in recruitment system by way of pre-college programming.

Figure 9. Recruitment and Admissions Framework Component



Recruitment & Admissions

2.1 Student Identification

2.1.1 Work with pre-college programs to identify potential recruits.
2.1.2 Monitor the participation of students enrolled in pre-college programs.
2.1.3 Attempt to match student academic and career goals with the institutional mission of the campus.
2.1.4 Use work study and teacher prep students to make visitations to middle and high schools to recruit students, and inform students about the need for study skills, good academic preparation, and advantage of taking AP courses
2.1.5 Develop and focus outreach programs on the prime-targeted population of the university.
2.1.6 Further coordinate recruitment with the Alumni association to identify future students

2.2 Admissions

2.2.1 Incorporate portfolios, interviews, and other non-cognitive assessments
2.2.2 Reduce the weight of SAT, ACT, and other tests

2.3 Orientation

2.3.1 Provide opportunities for pre-college students to live on campus.
2.3.2 Provide early orientation activities for families.
2.3.3 Involve all campus departments in the orientation process.
2.3.4 Provide satellite orientations for non-local students.
2.3.5 Ensure personal communications with students and families via phone and visitations.
2.3.6 Create freshman orientations that are required and for credit

2) ALTERNATIVE ASSESSMENT METHODS

Colleges should revise current selection criteria to include a variety of assessment techniques, including portfolios, interviews, and perhaps other non-traditional methods of pre-testing. Several panelists supported literature suggesting that the use of SATs for admissions was culturally biased and problematic for non-white students (Kalechstein, Pearl et al., 1981; Dreisbach et al., 1982), therefore not an equitable method of admission. However, current research still supports the SAT as the best available predictor of student success, especially in SEM and medical education (Sedlacek and

Prieto, 1990). Thus, institutions would be advised to provide a number of assessment methods, such as student portfolios and interviews, in response to the research findings.

3) VISITATIONS TO SCHOOLS

The use of work study students, graduate assistants, and other student personnel to make visits to local high schools (especially alma maters) in the capacity of recruiter is a cost-effective way of reaching out to the community. Additionally, this practice is appealing because of the close connection between college students and high school students as opposed to trying to bridge the gap via recruitment personnel. This practice can help generate a peer relationship between the college and high school that may be an important part of a student's decision to attend a particular campus.

4) ON-CAMPUS LIVING ORIENTATION

Providing high school students involved with pre-college programs with on-campus experiences, including living opportunities, was strongly supported by the panel as a method of recruitment and orientation. This practice has practical application for both students and colleges by giving students an opportunity to test the college environment and become more familiar and comfortable with the college, while the colleges enjoy the dividend of having a much better chance of recruiting students who have experienced their campus.

5) FRESHMAN ORIENTATIONS COURSE CREDIT

The panel suggested that orientations should be given course credit in order to justify its importance to students in relation to their academic pursuits. Some universities have designed three-credit hour programs for first semester students, while others have designed one-credit hour orientation opportunities. Although the establishment of mandatory orientations without credit is a standard practice on many campuses, it is possible that these practices develop a resentment within students regarding the use of their time. This is particularly true when orientations are poorly planned and offer students little in terms of increased knowledge regarding university services and regulations.

POLICY IMPLICATIONS/CONSIDERATIONS

- INTER-DEPARTMENT COOPERATION

Academic Departments must develop cooperative agreements to share information between pre-college programs and recruitment offices. This includes sharing of enrollment information, and when applicable, student outcomes. The possible bureaucratic headaches anticipated by faculty members regarding this 'micro-management' can easily be overcome by establishing an ongoing practice of student and program monitoring with the aid of a comprehensive student-tracking system. New hardware and software has made this task much more manageable, user-friendly, and time sensitive than previously available. Apart from monitoring activities, recruitment offices may want to become actively involved in the planning and operation of pre-college programs to support recruitment and orientation practice.

- STUDENT INFORMATION

In order for colleges to match student goals and aspirations with the college's mission, colleges and/or departments must develop information collection practices that produce a legitimate understanding of individual student's goals, needs, and abilities. Colleges must begin to move away from the 'fast-food' attitude of education, where focus is on recruitment rather than service, and begin to employ new methods of facilitating student learning from the student's perspective. To do this, institutions need to implement systems capable of coordinating the type of information required. University personnel, meanwhile, need to rethink what information is of most value to them and how they can access and utilize it. However, as one panelists duly noted, institutions should remember that the informal conferences and discussions between students and faculty are often the most valuable, so care should be taken not to reduce everything to a number in response to empiricism.

- EXPANSION OF ALUMNI NETWORK

Panelists supported both research and practice that utilizes alumni associations or networks as a communications tool for new recruits. Because these methods are extremely cost effective, alumni networks and services should be expanded to provide this service for colleges and universities. Although alumni clubs can be expensive to operate in terms of mailing and phone charges, anticipated gifts and donations can far exceed the operational cost when effective alumni programs are developed. Therefore, colleges can serve both their alumni community and the needs of the recruitment and admissions offices at the same time.

- LINKING DEPARTMENTS TOGETHER FOR ORIENTATION

Effective orientations must link campus departments together to create a cohesive unit that represents the diversity and uniqueness of the entire campus. Although departments may, and possibly should, have specific orientation activities, these and other activities should be incorporated into the broad scope of campus orientation. If, as the research concludes, the entire campus needs to be involved in the development and operation of retention programming (Noel, Levitze, Saluri and Associates, 1985; Smith and Sprandel, 1985), the orientation process, as a component of student retention services, should also be practiced in similar terms.

- REVISION OF CREDIT SYSTEM

In response to the panel support of "for-credit" orientation sessions, institutions must re-evaluate how this extra credit would impact upon their graduation requirements. Does credit mean that institutions must force students to take an extra course within a four-year program, or is it simply a matter of changing the numbers around? Institutions must address these issues and develop appropriate policy to eliminate ambiguity regarding academic requirements and student planning.

COMPONENT THREE: ACADEMIC SERVICES

DESCRIPTION

The Academic Services component is the most diversified and expansive component explored within the framework (See Figure 10). The focus of Academic

Services in terms of student retention and persistence is on providing supplementary support to students in addition to classroom/lecture practice. This component is divided into six categories, including: academic advising, supplementary instruction, tutoring/mentoring activities, research opportunities, pre-college programming, and bridging programs.

Academic advising is important to the direction that students will follow during their college experience. Forrest (1982) and Beal (1978) are among those researchers suggesting that academic advising is an important part of an effective student retention program. To be effective, it is important that students receive guidance that reflects their needs while also incorporating the knowledge of campus programming and bureaucratic practices. It therefore follows that candidates for advising be trained accordingly to handle the multi-faceted issues that may come up during advising sessions.

Beal (1978) also noted the importance in using faculty as student advisers. This has many potential benefits, including role modeling and mentoring in addition to the academic guidance that may be offered. However, as one panel member of this study noted, there is a major difference between formal advisements that are scheduled and informal advisements that take place in hallways and classes. Both practices are important and should be supported by institutions and departments to ensure that students receive adequate academic advising during their college careers.

Supplementary instruction programs, such as the one of the same name developed out of the University of Missouri-Kansas City by Deanna Martin in 1974, are becoming more prominent in colleges and universities. More colleges are beginning to develop alternative learning activities beyond that of regular classes to aid student comprehension of subject matter. However, whereas institutions have developed supplementary systems to support learning in college classes, institutions should strive to work closely with curriculum and instructional groups to develop sessions and materials to supplement instruction rather than perform remedial activities. Instructors of supplementary sessions should be trained to monitor the progress of students and identify potential problems.

Tutoring and mentoring practices form another support network for students. Colleges must make tutoring support available and affordable to students with such need. Faculty members should also make themselves available for academic assistance. Again, this "out-of-classroom" contact between students and faculty members has been substantiated by many researchers as an important factor in student persistence (Ugbah & Williams, 1989; Griffen, 1992; Astin, 1982), and has ramifications on the student's personal, social, and intellectual development (Griffen, 1992).

Students in science, engineering, and mathematics programs also benefit greatly from research opportunities. The link between classroom theory and real-world practice has positive implications upon a student's retention of knowledge while also making them more marketable upon their graduation. The development of local business partnerships and encouragement of on-campus research can create excellent opportunities for students.

Pre-college programs have long been an effective educational practice by post-secondary institutions. The MESA (California) and MSEN (North Carolina) programs are examples of how pre-college programs can help build the science pipeline by motivating students toward those areas. Colleges can benefit greatly from the establishment of these programs.

Bridging programs are an off-shoot of the pre-college program, but are more specific in nature. Colleges can utilize a student's senior year, or summer before matriculation, to help develop the learner's knowledge and ability to meet freshman program requirements. Study skills, time management, and course-related study are possible content considerations.

Figure 10. Academic Services Framework Component

Academic Services

3.1 Academic Advising

3.1.1 Provide academic advising and counseling for students on regular basis.
3.1.2 Provide appropriate training in academic advising for faculty.
3.1.3 Use faculty for the academic advising students when possible.
3.1.4 Keep log of student/faculty-staff interactions in a computerized monitoring system.

3.2 Supplementary Instruction

3.2.1 Encourage the use of peer study groups to foster learning and incorporate more labs with classwork.
3.2.2 Incorporate a variety of instructional methods to support student learning.
3.2.3 Utilize peers as instructional personnel for supplementary instruction when possible to assist students.
3.2.4 Offer supplementary courses that focus on academic support skills (e.g., study skills, note taking, listening, writing, reading, time management) and academic content (e.g., biology, calculus, etc.).
3.2.5 Monitor all supplementary instruction activities by students and log into the computerized database.

3.4 Research Opportunities

3.4.1 Support faculty to work with students on research projects.
3.4.2 Integrate regular research activities into curricula.
3.4.3 Develop industry partners for research opportunities.
3.4.4 Encourage business and industry to participate on campus through in-class demonstrations and experiments.

3.5 Pre-College Programs

3.5.1 Develop pre-college programs at the elementary and secondary education levels.
3.5.2 Monitor student progress in pre-college programs.
3.5.3 Offer pre-college programs on and off-campus.

3.6 Bridging Programs

3.6.1 Provide on-campus residency for students during bridging programs.
3.6.2 Provide summer academic and social support for admitted students before the commencement of the freshman year.
3.6.3 Monitor all student progress in bridging programs.

3.3 Tutoring/Mentoring

3.3.1 Provide regularly scheduled and easy access tutoring for students with regard to course work.
3.3.2 Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors.
3.3.3 Encourage faculty to support the academic needs of students outside of class time.
3.3.4 Encourage peer tutoring and group studying within class population.
3.3.5 Create reward structure for faculty involvement as mentors
3.3.6 Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.

MAJOR OBJECTIVES

1) ACADEMIC ADVISING

Colleges should implement a regular and standard practice of academic advising for students that is required by each department. The panel noted that the issue of student attitude is an important issue related to the success of an advising program, and that a pro-active system would require scheduled meetings to catch problems before they occur. However, as also suggested by the panel, it is ultimately the "substance and organization of the advising" that is most crucial. Therefore, the organization of the advising as well as the preparation (training) for advising are essential elements for the institution to assess and revise as necessary.

2) DIVERSITY IN INSTRUCTION

Supplementary instruction programs should utilize a combination of successful instructional techniques that support learning preferences of the entire student audience. The panel supported related literature suggesting that a diverse assortment of teaching methods were more effective in reaching students whose learning preferences are even more diverse (Whimbey et al., 1977; Hyman, 1988).

3) BRIDGING PROGRAMS

Colleges should focus on developing academic bridge programs between senior year in high school and the freshman year in college. This on-campus intervention programs affords students a number of potential benefits, including the opportunity to (a) become acclimated to the campus, (b) work through some of the freshman problems before the fall semester begins, (c) receive academic support in areas of weakness; and (d) become accustomed to the pace associated with academic learning at the college level.

4) PRE-COLLEGE PROGRAMS

To help develop the pipeline of students interested in attending college, institutions should place considerable resources into the development of pre-college programs. These programs, provided at levels as early as elementary school, help motivate students and get them thinking about the possibility of college. Clewell, Anderson, and Thorpe (1992), in their study of barriers to women and minorities in science, stated that the middle school years were particularly decisive points in a adolescent's life regarding whether they follow through with science or disregard it as a field of study. Colleges and universities can help expose students to the excitement of science while also exposing them to college life. As one panel member stated, "You can not start too soon."

5) ENCOURAGE INFORMAL FACULTY-STUDENT CONTACT

Colleges should try and promote informal contact between faculty members and students to build trust, support, and motivation during the college experience. Out-of-class contact with a student can create a bond and a sense of self-worth that can positively effect a student's locus of control and impact future decisions regarding college attendance and major. Extra assistance on projects, informal discussions regarding academic subjects, and special social gatherings can encourage this type of interaction.

POLICY IMPLICATIONS/CONSIDERATIONS

- FACULTY TRAINING

Appropriate steps must be made to ensure that faculty and other advisors are prepared to advise students in an appropriate fashion. Training and professional development must be institutionalized to ensure that faculty practice is held at an accepted standard and can evolve with changes in faculty, student population, and societal needs as a whole. Additionally, policies should be developed to identify faculty members who would be excellent advisors and eliminate those faculty who would not excel in that capacity.

- REWARD STRUCTURES

The panel was quick to note that new reward structures would have to be developed and implemented in order to encourage faculty to become involved in advising, tutoring, and mentoring activities. Although some faculty will do this automatically, time commitments often prohibit faculty members from this type of involvement. Therefore, many issues must be considered to develop supportive policy related to the issue of faculty rewards structure, including the redefinition of faculty roles on campus and a discussion of an incentive system and its relationship with current tenure contracts.

- STUDENT MONITORING

The monitoring of advisements and student growth in supplementary programs (of all types) is an important part of developing an accurate picture of who a student is. The collection of data in all areas of this component must be taken into consideration when developing a campus-wide data collection system. Institutions must conduct feasibility studies regarding the cost benefit and appropriateness of new systems designed to monitor student achievement. Equally important is to acknowledge and deal with a faculty culture which is renown for its inability and indifference in tracking and monitoring student progress.

- DEVELOPMENT OF LINKAGES

The continued process of curriculum development and instructional practice must be articulated in the design of supplementary programming. Alternative programming, such as supplementary instruction and bridging, should be seen as vehicles for curriculum and instructional revision. Programs such as Deanna Martin's Supplementary Instruction or Treisman's Emerging Scholars Program are two exemplary examples where direct linkages are developed between the supplementary or alternative program and the academic course work, to the extent that course instructors are often involved in the creation of the supplementary program. This link ensures a direct correlation between lecture and practice.

- ON-CAMPUS PROGRAMMING OF PRE-COLLEGE ACTIVITIES/COURSES

An emphasis should be placed on offering pre-college programs on-campus whenever possible. Although this presents particular logistical problems to an institution (and school system, in many cases), such as transportation, housing (for summer and weekend programs), and food, the use of on-campus programming has positive spin-offs far beyond the academic development that students experience. Programs such as MESA in California and MSEN in North Carolina have shown tremendous motivation and social development in their students. This anticipatory development of young students set in motion the desire and motivation to attend college after high school.

- LINKAGES WITH PRIVATE/PUBLIC SECTOR

The college must work diligently to develop appropriate links with local business and industry that will in turn provide opportunities for students to experience research opportunities related to their in-class learning. Faculty and administrators must receive the proper motivation and reward to develop these relationships, as they can initially take considerable time to generate and organize. Institutions need to reach out to the community, while businesses should be encouraged to take a stake in the education of college students at the local or national scale.

COMPONENT FOUR: CURRICULUM AND INSTRUCTION

DESCRIPTION

The continued development of curricula and pedagogical practice is perhaps the most important and fundamental need that colleges must address in terms of student retention (See Figure 11). The need to revise current practices, especially in gatekeeper courses, stems from what Tobias (1990) acknowledges as the practice of designing courses that are "unapologetically competitive, selective and intimidating, [and] designed to winnow out all but the 'top tier' " (p. 9). To combat some of these issues, the curriculum and instruction component has been divided into four categories: curriculum review and revision, instruction strategies, assessment strategies, and faculty development and resources.

Of primary importance to academic departments should be the continuous process of curriculum review and revision. This process should, in fact, become a mainstream part of curriculum development. Especially in terms of science, engineering, and mathematics, academic content must reflect the current dynamics of practice in the work place to be worthwhile and effective. Therefore, to prepare students for employment within SEM fields in the near future, it follows that SEM curricula must not only relate to current industry trends and practices, but also anticipate future practices and procedures (e.g., cutting edge technology/research). Equally stated, colleges must attempt to gain access to new equipment and provide instruction that utilizes state-of-the-art instructional technologies to ensure that materials are presented in a fashion that is commensurate with student learning preferences. The communication age has radically altered traditional learning and teaching styles, especially for students currently in elementary and secondary classrooms. Computers are second nature to new students matriculating to college or attending pre-college programs. Within a few years, virtual reality, a technology embodied as the ultimate in applied scientific and medical training, will also be second nature to undergraduates. Thus, colleges must allocate resources to the development of new teaching strategies which incorporate the latest in educational and industrial technology. Without these considerations, students may find that their knowledge is antiquated with the needs of society upon their graduation, when they should be on the cutting edge.

With the revision of curricular and instructional approaches also comes the need for a revision of assessment practices on campus. If new curricular practices are focusing on a higher level of knowledge and understanding on the part of the learner, assessment practices must be able to assess this higher learning. Thus, traditional methods of student evaluation are not appropriate to meet the needs of emerging teaching practice.

The incorporation of instruments which: a) measure student comprehension rather than memorization; and b) use of a variety of assessment methods, including short answer, essay questions, and observation, may offer a more accurate picture of student development and comprehension.

The instructional capacity of faculty to deliver materials in an exciting, interesting, and motivating manner is also essential to the quality of education delivered by an institution. The use of diverse strategies by teaching faculty should be representative of institutional practice. Research has shown that student progress benefits from the use of smaller classes and group practice. The hands-on and group collaborative approach made popular by the Emerging Scholars Program at Berkeley (Fullilove and Treisman, 1990) has shown that students, with specific reference to African Americans, are more inclined to produce academically at higher levels than students not involved in these programs. In effect, instructors must begin to employ practices more popularly related to K-12 education in order to reach students effectively.

Finally, if the three previous areas covered in this component are to become practice, faculty must receive appropriate training and support. Faculty development activities, with specific reference to teaching and assessment strategies, must become standard practice at colleges. Additionally, faculty should be rewarded and given opportunities to develop new techniques that may benefit other educators.

MAJOR OBJECTIVES

1) INSTRUCTIONAL PRACTICES

Colleges should attempt to utilize various methods of delivering content to students, focusing on comprehension rather than rote memorization. The use of hands-on, exploratory, and peer learning groups are a few methods of motivating students to learn. An important comment from the panel suggested that a good balance between several methods is the optimum in style, allowing students to learn through a variety of ways rather than traditional rote memorization.

Figure 11. Curriculum and Instruction Framework Component

Curriculum & Instruction

4.1 Curriculum Review & Revision

4.1.1 Develop an ongoing review process of curricula utilizing faculty input and outside consultation.

4.1.2 Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students.

4.1.3 Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction.

4.2 Instructional Strategies

4.2.1 Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students.

4.2.2 Provide homework, out-of-class assignments, and in-class assignments for students.

4.2.3 Utilize educational technologies to complement instruction.

4.3 Assessment Strategies

4.3.1 Develop assessment instruments that require students to utilize higher order thinking skills.

4.3.2 Conduct extensive student testing and assessment on a regular basis to monitor student progress.

4.3.3 Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.).

4.3.4 Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment.

4.4 Faculty Development/Resources

4.4.1 Provide appropriate instructional training for teaching faculty.

4.4.2 Develop an appropriate faculty reward system

4.4.3 Develop a center for teaching excellence to support teacher development

4.4.4 Make available and identify grant opportunities for classroom research

2) CURRICULA REVIEW

Colleges should develop an integrated process of curriculum review to ensure that all curriculum pieces are up-to-date and relevant to the society's needs. At many universities, individual faculty members are left in isolation to decide what to include in a course syllabus, leaving much to be desired in terms of "quality control." This is a greater issue considering that most faculty have little or no background in learning theory or educational practice. Therefore, a systemic and cyclical review process that allows for faculty to review all curricula on a rotating basis would help control the content delivered in classes. Additionally, it also serves to keep curricula current.

3) PROFESSIONAL DEVELOPMENT

Colleges need to provide extensive and ongoing professional development to faculty and staff to incorporate new teaching strategies and assessment techniques. With regard to the discussion of curriculum revision and assessment, faculty cannot be expected to teach specific, if not more standard, courses without opportunities to share and learn from others with different experience. The panel was extremely supportive of the substantial literature regarding professional development, and one panelist in particular suggested that the absence of professional development activities would restrict any new initiatives from taking hold. If colleges and universities are serious about teaching as a focus of their mission, then it is incumbent upon them to provide support for their instructional staff.

4) FACULTY REWARD STRUCTURE

The development of a faculty reward structure as a specific objective was an addition to the framework by the panel. Throughout the study, panelists discussed the importance of building in rewards for faculty to motivate them to change. Apart from the development of a cohesive policy statement regarding reward structures, the administration must actively participate in revision of the institutional mission, and ultimately the reward structure, to generate long-term support from the staff. Faculty and staff need to see that their efforts are rewarded and taken seriously by administration.

5) ASSESSMENT TECHNIQUES

Campuses should design and implement new assessment techniques which are multi-faceted and regard the integrity of human learning and understanding. Teaching and learning practices that require students to evaluate, synthesize, analyze, and create, among others, also require new methods of assessing student progress (Ryan & Kuhs, 1993; Bird, 1990). Although the literature suggests that these practices are important, the panel questioned the capability and the readiness of the faculty to become this deeply involved. As one panelist asked, how is a college that has not taken teaching seriously going to take to higher level assessment practices? With this in mind, it is evident that colleges currently struggling with similar issues must work to develop a foundation upon which further reform can take place. The faculty must be swayed to the new ways, and this requires support in terms of training, leadership, rewards, and the freedom to make mistakes.

POLICY IMPLICATIONS/CONSIDERATIONS

- REWARD AND RISK

Faculty members may require a reward structure emphasizing the importance of curriculum revision and instructional reform to motivation them to alter current teaching practices. For faculty members to accept this shift in practice respectfully, they will need to see that the administration takes reform seriously, which can be measured by what administrators actually say and do. Additionally, faculty members will have to be assured that they are safe to take risks in new development and practice, and that failure in trying does not affect tenure or other rewards.

- INSTRUCTIONAL TECHNOLOGY

Faculty members will need to have access to the latest in instructional technologies in order to fully take advantage of new methods of teaching and learning. Therefore, colleges must budget considerable capital investments for lab and classroom instructional equipment. For SEM areas, this can be more specialized than in other departments. Currently, some colleges are implementing broadband cable into their buildings to support real-time video support for classroom instruction as well as distance-learning equipment.

- TIME ON TASK

The development and practice of the new teaching strategies discussed herein require a considerable time investment by faculty members and other instructional staff. The use of multiple methods of assessment, especially those which are more appropriate for measuring comprehension, require more time on task by instructors. Colleges that require faculty to teach more than three courses per semester will have a difficult time taking on these new responsibilities. While colleges may stretch the budget in the short term by exercising its option to have large teaching loads, the 3,800 post-secondary institutions across the country are in keen competition for a shrinking student population, therefore suggesting that supply and demand will require institutions to provide outstanding service to its clientele—the student.

- STUDENT/PROGRAM MONITORING

Colleges must develop intricate monitoring systems to explore the progress of institutional practices and programs and student growth. Institutions of higher education, of all types of institutions, should be expected to utilize exemplary practices of program and student monitoring. To adequately assess how a program is faring, or how students are progressing in their studies, an effective system of monitoring is required to collect data that in turn can be quickly analyzed and distributed to individuals responsible or affected by the data. This not only requires hardware and software, but also personnel to plan and employ the research. Also required is policy regarding the use of the data. The collection of data for data purposes is a waste of institutional resources. Institutions must plan how they can use the data before any action is taken.

COMPONENT FIVE: STUDENT SERVICES

DESCRIPTION

As Tinto (1993) and others have suggested, the "social integration" of students with the institution is an important factor in their ability to persist. The role of the student services department has evolved with this theory to attempt to deal with many of the issues facing students on campus. The atmosphere and climate of a university, reflected by how the institution treats and supports students and by the positive nature of peer relations on campus, is important to the self-esteem and confidence a student generates about him or herself. Neisler (1992) concluded that personal, emotional, and family problems, in addition to feelings of isolation and adjustment to college life, are strong barriers to retention for African American students. Therefore, the campus must focus on developing an atmosphere that is supportive, safe, and pluralistic. The outcomes of this study found that campus climate, accessibility to campus, campus housing, and career and personal counseling are areas that should be considered in terms of their effect on student retention.

Campus climate is not some intangible, abstract concept that 'just happens.' More accurately stated, campus climate is the development of the beliefs and practices of the administration, faculty, staff, and students belonging to that institution. Therefore, it can be created, and to some degree, controlled. To develop a positive campus climate supportive of learning and human development, campuses should promote diversity on campus and extol the virtues of shared culture (Justiz, 1994). This practice allows colleges and universities to better reflect the changes in society and promote pluralism. Ensuring safety for students and providing social opportunities for students to forge new friendships and build trust with their fellow classmates are examples. The existence of student groups and organizations can also support a positive climate by integrating students into the campus environment.

Accessibility to campus is also an important concept for institutions to consider. Administrators must consider the use of flexible scheduling practices to allow students with different schedules to be able to enroll in classes that they need for graduation. The use of weekends and evenings are alternative methods for class scheduling, and offering classes in subsequent semesters rather than flip-flopping semesters can make the path to graduation much more palatable to students. An additional consideration is the linkage of public transportation systems to campus. Students who have difficult times accessing the campus are less likely to persist. However, the utilization of distance learning technologies can also help alleviate these problems.

On-campus housing is an important element directly related to student persistence due to the integration of the student to the campus (Pascarella, 1984;

Chickering, 1974; Astin, 1977; Pantages and Creedon, 1978). However, colleges must ensure that housing is accessible and affordable for the student population, and offer choices in terms of type of housing. Additionally, campuses should also consider the changing demographics of college students. Native Americans, for example, are well known for the advanced age of their college students (unofficial reports of 28-years of age). This trend in the advancing age of the student population suggests that institutions must start thinking in terms of average student age on campus and add housing for spouses and children.

Finally, counseling services are also related to student retention. Studies of the effects of counseling and at-risk students (Steinmiller & Steinmiller, 1991), African Americans (Trippi and Cheatham, 1989), and first-generation students (Richardson and Skinner, 1992; Padron, 1992; Justiz, 1994), confirm that counseling services are important components of student retention programs. Colleges need to deal with the added stress and burden that today's students bring with them to campus. Counseling services should provide support for students in terms of social needs and career counseling. In providing these services, colleges must make the services accessible to the student population and provide alternative methods of counseling to suit particular needs of the population.

Figure 12. Student Services Framework Component

Student Services

5.1 Campus Climate

5.1.1 Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula.
5.1.2 Provide a safe campus environment for all students, faculty, staff, and visitors.
5.1.3 Provide non-classroom opportunities for faculty-student interaction.
5.1.4 Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events.
5.1.5 Support the organization of student clubs, associations, and fraternal organizations on campus.

5.2 Accessibility/Transportation

5.2.1 Offer classes in a variety of timeslots to permit flexible scheduling by students.
5.2.2 Ensure transportation link with local area metro system for increased access to campus.
5.2.3 Offer classes on weekends and special Friday-Saturday combinations.
5.2.4 Offer classes in concurrent semesters to allow for student flexibility in scheduling.
5.2.5 Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on -campus classes.

5.3 Housing

5.3.1 Ensure affordable housing and meal plans.
5.3.2 Encourage on-campus housing for students.
5.3.3 Provide an appropriate number of housing slots to meet the needs of the student body.
5.3.4 Develop housing patterns that may incorporate choice of major or other demographic issues.

5.4 Counseling

5.4.1 Provide psychological and social counseling to students to support added stresses in society.
5.4.2 Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal.
5.4.3 Provide counseling services that are cognizant of the cultural and racial issues facing students.
5.4.4 Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs.
5.4.5 Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions.

MAJOR OBJECTIVES

1) DIVERSITY AND MULTICULTURALISM

Colleges can build a pluralistic environment by promoting diversity and multiculturalism through special programming and activities. Studies by

Astin (1993) and Justiz (1994) found that campuses that embraced diversity and multiculturalism had student populations and cultures that were very positive, capable of change, and had high levels of academic quality. Although the panel was extremely supportive of this objective, they were also cautious, noting that the experience must be real and not just exist by name. As one panelist stated, "almost all campuses say they do the above," but few act upon such need.

2) FLEXIBLE SCHEDULING

Allowing the scheduling of classes in a variety of timeslots allows a broader constituency of students to attend classes. Many universities have fixed schedules which allow for little flexibility in course selection, mostly because of budget reasons. However, there are instances when this occurs due to the inflexibility of faculty to try different schedules. Adding Saturday courses, or moving courses around the schedule, may allow students to enroll in more of the classes they need during a semester rather than wait for a rotation where they have no conflict.

3) CAREER COUNSELING

Colleges must ensure that students are sent on an academic track that will direct them toward their career destination. Occasionally, students are advised to take certain courses that in reality are poor choices and may extend their attendance. Career and academic counselors need to be well-versed in the requirements, schedules, and policies regarding graduation as well as a keen knowledge of what business and industry are looking for. This can only be done through a expansive knowledge of the student by qualified counselors.

4) FACULTY-STUDENT INTERACTION

Informal contact between faculty members and students are part of a rich atmosphere of sharing and caring at college campuses. Students feel much more relaxed and cared for when faculty are committed to their success. The sister version of this objective was presented under the academic services component. As stated previously, the social integration of students is paramount to student persistence, enjoyment, and achievement in college. The willingness and acceptance of staff to "rub shoulders" with students beyond the confines of the classroom can have long-lasting effects.

5) ROOM AND BOARD

Affordability and comfortability are important considerations for students in terms of housing and meals. Campuses should look at numerous plans which allow students to choose the type of housing which best meets their financial ability and living requirements. This affects the mature student with family, the economically disadvantaged student, and the student living far from home.

POLICY IMPLICATIONS/CONSIDERATIONS

- SAFETY

A safe campus must be supported by a fully-funded police/security department. Problems associated with gang violence, data rape, and other issues that plague many campuses must be alleviated if campuses are to enjoy a trusting, comfortable campus that supports academic and social growth. Programs and initiatives such as door-to-door escort services for students and emergency alarms/phones are practices that many campuses are implementing to assist with the fight against campus crime.

- STUDENT ORGANIZATIONS

Colleges must be supportive of student clubs, organizations, and government to develop an inclusive student population who are empowered to effect the climate of their campus. However, while the literature suggested that clubs based on race or major had a positive effect on campus, the panel suggested the opposite—that clubs "integrate and not segregate." This suggests that the campus must decide what works best for them. As with many of the objectives within this framework, perhaps balance is the best advice—allow a little of everything to support diversity, freedom, and choice.

- COURSE SCHEDULING

Campuses must carefully coordinate the retooling of class schedules to meet the needs of a diverse student population. While adding classes or moving them around the schedule may be beneficial to students, it may have ramifications in terms of departmental budgeting and faculty hiring. Departments should conduct an assessment of current scheduling and attendance practices in relation to student preferences to determine what changes should be made. If new patterns of course scheduling are implemented, issues related to faculty schedules may have to be discussed and amendments made.

- DISTANCE LEARNING

Campuses new to distance learning practice must develop policies that prescribe standards for the conduct of such classes in terms of attendance, student involvement, course work, and assessment. The distance learning campus is a new and evolving practice that is beginning to change how post-secondary institutions serve their clientele. This new method does not allow for traditional methods of class involvement or assessment. However, distance learning is opening up new opportunities in these areas, including the use of the Internet for conferencing and research. Regardless, institutions must apply new policies to deal with these issues.

- HOUSING

Colleges must focus on developing acceptable housing for students on campus. Housing must be conducted such that it is affordable to students but also does not draw from the university budget. On-campus housing should be a self-sufficient component of campus service, if not money making. Administrators must begin to think of campus housing not just as rooms for students, but as living units where students spend a considerable amount of time. For many freshman students, this is their first foray away from home, so the concept of "home" and "comfort" is very important. This is an important consideration for housing managers to instill into their daily operations.

- COUNSELING

The Generation X population, with conceivably more pressure and less future than previous generations, brings to college lower levels of self-esteem, locus of control, and academic preparedness in many cases. To meet the need of future student populations, institutions will require a significant increase in counseling staff. This again has implications regarding budgeting and staffing.

FINAL CONCLUSIONS

The framework just presented is, in effect, a set of conclusions and recommendations based upon the study findings. The framework offers institutions an effective set of options to consider during program development. However, the following additional conclusions draw upon issues that were found to be global needs in terms of student retention.

- The development and implementation of a campus-wide student retention program is a complex issue requiring the involvement of the entire campus. Although departments may conduct their own programs, it is not until the entire campus directs a unified effort at reducing attrition that large-scale changes can be seen. To do this, the program must have leadership and support from the President's or Provost's office, involve the entire campus in shaping program operations, and keep ideology focused on the student.

- The role of faculty and the issue of reward structures must be reconsidered to meet the needs of the student. Current reward systems at a majority of institutions are structured in a way that deters faculty from focusing on teaching or from the student. Most universities have three implicit and explicit focuses for faculty in which their tenure is often determined. These include the ability of faculty to: 1) publish articles; 2) attract grant money; and 3) provide community service. None of these three areas discuss either teaching practice or the student, illustrating the most apparent problem facing colleges and universities today. It is not that faculty are not interested in working to help students achieve and persist, but the pressure to produce in other non-academic areas restricts involvement. If faculty are to turn more of their attention to student needs and teaching as a whole, the institution must incorporate these actions into the tenure structure. Antithetically speaking, the absence of these details in tenure contracts and reward structures sends an immediate and explicit message to faculty that teaching is not highly regarded during the consideration of tenure.

- The nature of a student retention program must be specific to the nature of the campus itself. Retention programs that work well on one campus will not necessarily work well on another campus. The student body, faculty, and staff bring different aspects to the campus that make it unique and special. Additionally, the mission of the campus and the environment and culture of the institution are also unique, suggesting that retention programs, although able to borrow from programs, must retool them to meet specific campus needs.

- Institutional research should become a standard part of campus operation that supports the improvement of teaching and learning on campus. Currently, many institutional research departments are small departments that provide only global explanations of how the campus operates, with little of this data filtering back to the practitioners. In reality, teaching faculty and administrators should embody the practice of research to ensure that programs are fulfilling the desired need. Institutional research departments, in response, must be organized and managed in a way that provides practitioners with the kind of data that can support campus improvement. This suggests that communication between institutional researchers and practitioners must be progressive and focused on the needs of the student population and campus.

- The college or university must strive to institutionalize the new practices and programs by way of policy initiatives. By entrenching the program into college policy, it ensures the continued operation of programs and requires line-item budgeting that is not as susceptible to variations in soft-money (i.e., grants, gifts) allocations.

RECOMMENDATIONS

The framework and information contained within this study form a set of prescriptive actions that can be utilized as an effective guide for organizing and developing a student retention program. The framework has been organized to fit the organizational patterns of most four-year institutions and has taken into consideration many of the practices that have been found to positively affect student persistence. The primary recommendation of this study is for institutions seriously interested in the pursuit of higher student persistence at their college to utilize the framework presented in this study as a working guide during the planning stages of program development. The benchmarks identified at the beginning of this chapter can help institutions focus on specific needs and requirements during the entire process. Because the development of a campus-wide program is an immense task, the components and objectives laid out in the retention framework can assist by illustrating specific target areas to focus on, especially during the early stages of planning. Once practitioners in related areas or departments are brought into the planning and development cycle, they can request considerations or ideas that more appropriately reflect campus needs.

In recommending this framework as a guide for program development, it is especially important to remind users that the use of the framework as anything more than a set of possible guides or considerations may be deconstructive to their mission. Just like a hiker or hunter may use a compass to help direct them through a deep brush or forest, program planners can use the guide only as an instrument to provide direction. This instrument cannot be expected to tell planners what to do or how to do it, but it can provide them with the foundation from which the program can be forged.

In keeping these issues in mind, the key to any retention programming on campus is the use of on-campus research to identify the specific needs of the campus. As stated in the program benchmarks, an institution cannot expect to replicate programs and expect the same success that other institutions have. The nature and culture of the campus which makes it unique must be woven into the fabric of every program. All actions on campus should be considerate of the needs of the students, faculty, and staff, and focused on the constant redevelopment and enhancement of campus life and academic learning.

Therefore, this framework can provide the first steps for program development. The remainder of the mission must be taken by the individuals on campus who understand the complexities of their institution.

RECOMMENDATIONS FOR FURTHER STUDY

Three recommendations in particular have been identified regarding further study based upon the findings of this research study.

- The framework developed and presented in this study should be applied at an institution and assessed to its validity and usefulness in the planning stage of program development. Findings from these studies could be used to refine the framework to closer meet the needs of institutions.

- A guidebook should be written describing in detail the issues related to the components and objectives described in the framework. Other than a very few publications which explain some of the dynamics of student leaving and retention, it would be useful to provide a document which describes more fully the details regarding the components and objectives presented in the framework. This guidebook could be used in tandem with the framework.

- Because the organizational and management approaches of a campus are such an important part of campus change, an important area for researchers to investigate is the identification of management structures and strategies that can address the needs of this type of program implementation. Although this study originally planned to address this issue in more detail, it became apparent early on that an independent, full-scale study regarding management and structure was required.

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APPENDICES

APPENDIX A

LENNING'S FACTORS ASSOCIATED WITH STUDENT PERSISTENCE

LENNING'S FACTORS ASSOCIATED WITH STUDENT PERSISTENCE

Lenning (1982) synthesized the studies of Cope and Hannah (1975), Lenning, Beal, and Sauer (1980), Lenning, Sauer, and Beal (1980), Pantages and Creedon (1978), and Ramist (1981) as follows:

Age	Older student more mature, highly motivated. Older students "rustier" on their skills, less able to adapt quickly to changing conditions
Sex	Men more likely to dropout at large nonselective universities and because of academic reasons; Women more likely to dropout when male-female ratio is large and because of non-academic reasons
Socioeconomic Status	Low SES students have higher dropout rate
Ethnic Background	Blacks and American Indians dropout more often than other students, but these differences disappear when SES, ability test scores, and motivation are controlled. Hispanics tend to dropout more often, irrespective of controls used.
Marital Status	Increases men's chances and decreases women's chances of persisting until graduation
Hometown Location	Rural area students tend to dropout more often, while size and nature of college may make a difference in this rate
STUDENT ACADEMIC FACTORS	
Aptitude Test Scores	Lower college-admissions test scores are related to higher attrition
High School Achievement	High school GPA and class rank have been found to have a higher relation to attrition than any other single predictor
Study Habits and Attitudes	Students with poor study habits and attitudes tend to drop out more often
Subjects and Number of Courses Taken in High School	Those who took college-prep programs tend to persist more.
College Program	Student's major may relate to attrition, but this differs from college to college
College Grades	Dropouts tend to have lower grades, but may have satisfactory or even excellent grades in many cases.
INITIAL STUDENT ASPIRATIONS AND MOTIVATIONAL VARIABLES	
Degree Aspiration	Aspiration to professional or doctoral degrees relates positively to persistence
Termination/Completion Plans	Intention upon entrance to dropout suggest than attrition is likely
Commitment to the College	Positively related to persistence
Vocational and Occupational Goals	Positively related to students in these types of programs only
Familial Aspirations for College	Strong parental aspirations relates positively to student retention.
STUDENT PERSONALITY AND VALUE [illegible]	
Maturity and Responsibility	High maturity and responsibility relates positively to retention and completion
Independence and Autonomy	Relationship between a student's independence and the college atmosphere is related. When the two are conversely related, attrition is higher; when the two are positively correlated, retention is higher.
Intellectual Orientation	Intellectual students will persist in intellectual college atmospheres. When that atmosphere does not exist, students may leave in disgust.
Creativity	Creative students may leave if the campus does not provide a creative atmosphere.
Self-concept	Positive self-concepts and self-confidence are positively correlated to persistence
Anxiety	Anxiety about success can lead to persistence, but only if it is not too great
Assertiveness	Related to persistence to a certain level
Value Orientation	Positive relationship to persistence when the values of the student and college are similar
Student Concern about Finances	Although finances are a very real concern, the relationship to persistence is generally more perceptual than in reality.

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[illegible]	
Prestige	Completion rates higher at more prestigious universities
Size	Less student involvement at larger universities, negatively affecting persistence
Control	Privately controlled college tend to have higher student retention
Type	Four-year more persistence than two-year; single-sex colleges higher than coeducational institutions
Affiliation	Religious affiliation tends to be attributed to higher retention and persistence
Selectivity	The more selectivity, the higher retention rate
Housing	Residential campuses have higher retention rates than commuter campuses, as do on-campus fraternities and sorority houses
Student Services	The availability, quality, and use of student services (e.g. counseling, advising, etc..) tend to promote student retention
Institutional Mission	Clear communication of an institutions mission and goals are attributed to higher persistence
[illegible]	
Student Satisfaction	Positively correlated to persistence
Social Integration/Peer Group Relations	Frequency and quality of interactions relates to retention
Family-College Relationship	Commitment of parents to the college is attributed to student retention
Out-of-Class Interactions with Faculty	Frequency and quality of interactions relates to retention
Faculty Concern for Students and Teaching	Genuineness and strength of faculty's interest and concern is directly correlated to persistence
Institutionally Generated Student Development	Student growth, especially in terms of academics, is positively correlated to persistence
Commitment to the College and Graduation	Positively related to student persistence
Extracurricular Involvement	On-campus extracurricular activities are positively correlated to student persistence, except when overdone
Responsiveness to Student Complaints and Expressed Needs	Ability of the institution to respond efficiently to student needs
Student Expectations and Realities	Degree of congruence or discrepancy between student expectations and campus and academic realities are significant
Academic Program Involvement and Success	Honors programs, foreign study programs, tutoring/peer counseling, instructional assisting, academic program review, and other involvement in academic life of campus all contribute to student persistence
Learning-Preferences and Teaching-Method Congruence	Matches and mismatches in teaching/learning styles may affect retention
Compatibility Between Student and Institutional Values	Congruence or discrepancy between student and institutional values are related to retention
Student-Body Characteristics	Student similarities, in terms of religion, race, and geographic background are attributed to retention
Student Participation in Student Services	Student need and participation in student services affect persistence
Student Ability and College Demands	Ability of student to meet the demands of college and derive satisfaction from that challenge is positively correlated to retention
Student and Comfortable Environment	When college environment and atmosphere is comforting to the student, while also academically challenging, is related to persistence

SOURCE: Lenning, Oscar T. (1982). Variable-Selection and Measurement Concerns. In E. Pascarella (ed.) Studying Student Attrition. San Francisco, CA: Jossey-Bass Inc. (pp. 17-33)

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APPENDIX B

INFORMATION ON INTERVENTION PROGRAMS

INFORMATION ON INTERVENTION PROGRAMS

The following is a listing of information from eight successful retention programs extracted from the literature. For a further listing of exemplary programs, see Diana Saluri's *Case Studies and Successful Programs* in Noel et al.'s Increasing Student Retention (Jossey-Bass Inc.).

Baylor College of Medicine
Science Enrichment Program

Program beneficiaries' educational level: Rising sophomore and junior, college students

Selection criteria for program participants: Open to all minority students whose academic record indicates the need to improve their grades and standardized test-taking ability in order to ensure competitiveness as medical school applicants. Applicants with a college GPA greater than 3.5 and combined SAT score greater than 1100 were not admitted. Of the 116 participants studied form 1980-1984, 57 percent were African American, 41 percent Mexican American, and 2 percent Native American.

End goal of program: To increase the size of the minority applicant pool and to increase the competitiveness of program participants for medical school admission.

Selected interventions: Personal and group counselling regarding the medical school application process, adjustment to the medical school environment, and sources of financial aid.

Program description: 8 week summer session, offering:

- basic science (Biology, Chemistry, Physics) curriculum along with some clinical and laboratory experience in academic medical center
- personal and group counselling regarding:
  - -the medical school application process
  - -adjustment to the medical school environment
  - -sources of financial aid.

Evidence of program's success: Of the 378 students who participated in the program through 1984, 68 percent applied to medical school. Seventy-three percent (73 percent) of those who applied were accepted to a U.S. medical school (50 percent of the 378 participants).

Information Source(s): Pavlik, V., Rankin, B., Ballbona, C., Bacon, R., and Tristan, M. (1991). Factors Related to Medical School Application and Acceptance in Minority Summer Enrichment Program Students. Journal of the National Medical Association. 83 628-632.

Chicago State University
Student Support Services Program

Program beneficiaries' educational level: College students: new entrants and continuing students

Selection criteria for program participants: Skill-deficient, low income, first-generation, or physically handicapped — as identified by admissions information and diagnostic testing.

End goal of program: To increase the retention and graduation rates of the university's students.

Selected interventions: Note-taking; test-taking; writing; problem-solving; counselling; mentoring; instruction in English and mathematics; tutoring; field trips; career workshops.

Program description: An academic year program (plus six-week summer component in math and writing) for 210 students per year, offering:

- monitoring academic progress of new entrants
- instruction in mathematics and English
- laboratories in math and writing (small group and individual tutoring and practice, application of math to problem-solving)
- study skills workshops (plus self-study tapes and software): note-taking, library usage, test-taking, stress reduction, and time management
- academic and personal counselling — plus student mentors and peer counselors
- motivational activities: cultural enrichment field trips, career workshops, use of career-identification instruments, graduate and professional school workshop.

Evidence of program's success: As of Fall 1988 the retention rate for students who had participated in SSSP as freshmen was higher than the retention rate for all students who entered as freshmen the same year — despite the disadvantages with which the participants entered. Of all 1987 entrants, 51 percent were retained, compared with 79 percent of SSSP participants. Similarly, retention rates were 34 percent (all) and 45 percent (SSSP) for 1986 entrants, and 24 percent (all) and 36 percent (SSSP) for 1985 entrants.

Information source(s): Pinkston-McKee (1990). Student Support Services Program. (ERIC Document Reproduction Service No. ED 321 645)

Delaware State College
Project Freshman Attrition Reduction (FAR)

Program beneficiaries' educational level: College freshmen

Selection criteria for program participants: All freshmen enter first and second components of program. All are invited to enter third component. Those at risk of dropping out are urged to participate in the third component.

End goal of program: Retention of entering students at Delaware State College.

Selected interventions: Counselling; tutoring.

Program description: During academic year, three components:

- *Preventive Component:* one-credit weekly orientation required for all freshmen
- *Early Warning System:* use of Dr. Alexander Astin's dropout predictor instrument to identify students likely to drop out
- *Rehabilitative Component:* counselling, tutoring, human development workshops, dormitory counselling. Focus: self concept, educational values, and study attitudes

Evidence of program's success: Freshman attrition rate fell from 41 percent in 1976 to 16 percent in 1981. Freshman probation rate went from 56.5 percent in 1976 to 31.9 percent in 1979. The number of freshmen who graduated four years later rose 22 percent. The program has been replicated at 40 colleges.

Information source(s): Gates, Rebecca T., "Project Far: A Blueprint for College Student Retention," in Niba, Johnson N. and Regina Norman, editors, Recruitment and Retention of Black Students in Higher Education, National Association for Equal Opportunity in Higher Education, Research Institute, 1989.

Harvard College
Decentralized Advising System

Program beneficiaries' educational level: Freshman through Senior, with special emphasis on freshmen students.

Selection criteria for program participants: All entering freshman.

End goal of program: To provide maximum support for the diversity of students at the college.

Selected interventions: Advising; counseling; orientation; student housing

Program description: During the freshman year, the dean of freshmen and staff of over seventy full- and part-time advisers provide advising services. Faculty and senior administrative staff in the faculty of arts and sciences serve as nonresidential advisers and as members of the board of freshmen advisers. Entering freshmen have a designated adviser who works with the student in academic counseling, personal support, and provides referrals to whichever resources may be necessary to ensure the smoothest transition to the life of the college. The freshman dean and staff coordinate housing for freshman prior to matriculation, coordinate a full week of orientation activities for students, hold an annual retreat for all adivsers, produce a handbook for freshman advisers, hold weekly luncheons for nonresident advisers in addition to evening meetings. Primary aspect of support services for first-year students involves preparation for entering the sophomore year.

Evidence of program's success: Extremely low freshman attrition rate, approximately 1 percent.

Information source(s): Saluri, Diana (1985). Case Studies and Successful Programs. In Noel, Levitze, Saluri and Associates (Eds.) Increasing Student Retention. San Francisco, CA: Jossey-Bass, Inc. (pp. 402-447).

Meharry Medical College
Biomedical Science Program (BSP)

Program beneficiaries' educational level: Most post-freshmen, -sophomores, and -juniors. some precollege. a few postbaccalaureate.

Selection criteria for program participants: Self-selection. Result: 99 percent African American, mostly from predominantly black colleges in southeastern U.S.

End goal of program: To "increase the pool of properly prepared minority applicants for medical and dental schools."

Selected interventions: Reading comprehension; mentoring; supplemental instruction; tutoring; seminars; field trips.

Program description: Summer program, generally enrolling about 60 students. Offered to each student for three consecutive summers (usually taken for one).

- all students pretested and post-tested
- daily classes in each of four subjects: biology, chemistry, reading, and mathematics or physics
- weekly laboratory sessions and seminars
- field trips to health facilities

Evidence of program's success: As of 1973, 90 former participants should have been eligible for entry into professional school. Of these, at least 45 (and possibly as many as 58) applied to medical school. Thirty-one (53 percent to 69 percent of the applicants) were accepted. This compares favorably with the 35 percent acceptance rate of the applicants to all U.S. medical schools. As of 1980, "approximately 480" students had participated in the program. Of these, 265 (55 percent) responded to a survey. Of the respondents who had applied to dental and medical schools, 85 percent (47 percent of the 480 participants) reported that they had been accepted.

Information source(s): Murphy, Lucy P., McNair, E. Wesley (1981). Summer Program in Medical School Environment for Undergraduate Students: An Evaluation. Journal of Negro Education. 50(4) 407-14.

Birch, Janet S. and Wolfe, P.H.(1975, November). An Enrichment Program for Minority Students. Journal of Medical Education. 50 1059-1060.

University of California at Berkeley
The Mathematics Workshop Program (MWP)

Program beneficiaries' educational level: College freshmen

Selection criteria for program participants: Eighty percent of the participants are African American or Latino. Participants are selected by the staff of the Professional Development Program via rosters from the Office of Admissions and Records. The MWP program recruits the best of minority students in the mathematics fields. These students score two full standard-deviations above the national average for minorities on SATs.

End goal of program: To promote high levels of academic performance among African American and other minority students in mathematics courses.

Selected interventions: Working with groups; problem-solving; motivation; support groups; test-taking; conceptualization

Program description: In mathematics labs, students are divided up into groups of 5-7 students who work together for approximately two hours, twice a week. Worksheets are the primary component of these labs, and students are enticed to help and support each other in solving the worksheet problems. Students spend approximately half of their lab time working independently and the other half in their support groups.

Evidence of program's success: Statistics from a study of 646 African American undergraduates at UCB between 1973 and 1984 show that those who were involved with the MWP significantly outperformed their non-MWP peers with similar or better standardized test scores. During the 1983-84 year, 58 percent of MWP students earned a B- or better in mathematics 1A compared to only 23 percent for non-MWP students. Similarly, during the period from 1978-82, 54 percent of MWP students earned a B- or better compared to only 16 percent of non-MWP students enrolled in the same course. The graduation rate or continued enrollment of MWP students by the spring of 1985 stood at 65 percent. Only 41 percent of the non-MWP students had graduated or were still in school. Students were observed to: a) create academically oriented peer groups whose participants value success and academic achievement; b) commit themselves to hard work to achieve success; c) spend more time on learning tasks; and d) persist in college longer than non-MWP participants due to social and study skills acquired during the workshop.

Information source(s): Fullilove, Robert E., and Treisman, Philip U. (1990). Mathematics Achievement Among African American Undergraduates at the University of California, Berkeley: An Evaluation of the Mathematics Workshop Program. Journal of Negro Education. 59 (3) 463-478.

University of Notre Dame
First Year of Studies (FYS) Program

Program start date (year): 1969

Program beneficiaries' educational level: Freshman students.

Selection criteria for program participants: All freshman students required to enroll in course offerings.

End goal of program: Two main goals: 1) provide a freshman curriculum which provides a strong general education and gives freshment he opportunity to explore before making a commitment to a major; and 2) provide a support system appropriate to the needs of the freshman student.

Selected interventions: Supportive curriculum; career guidance, advising, and counseling; scoial occassions.

Program description: The Freshman Year of Studies (FYS) Program is a first-year program for all entering freshmen, regardless of major. In fact, students do not choose a major until their sophomore year. A separate curriculum was designed by the faculty to support the academic needs of the students, and student support systems, such as guidance, advising, and the learning resource center provide the necessary support ingredients to complement the curriculum. The individual attention given students in the FYS program makes it virtually impossible for students to "simply leave the university." Strong communications between campus and parents and parent orientations, agressive counseling, newsletters, regualr contact by the FYS staff and the faculty and residence hall staffs are important features. Most importantly, however, is the freshman curriculum. While all students take the same format of courses, they do not necessarily take the *same* courses. Course selection may be toward the expected major, but data from the past 12 years show that 60 percent of students change their major at least once during their freshman year.

Evidence of program's success: Although there is no pre-program data, the current attrition rate in the freshman year is only 1 percent, and from freshman to senior is 8 percent.

Information source(s): Saluri, Diana (1985). Case Studies and Successful Programs. In Noel, Levitze, Saluri and Associates (Eds.) Increasing Student Retention. San Francisco, CA: Jossey-Bass, Inc. (pp. 402-447).

Unspecified Institution

An experiment on the effects of Supplemental Instruction (SI)

Program beneficiaries' educational level: College (89 percent freshmen)

Selection criteria for program participants: (1) enrollment in a first-semester calculus course for business and economics majors, (2) availability of complete high school and college records, and (3) no prior enrollment in a first semester business calculus course or its equivalent. (Result: 14 percent minority students.)

End goal of program: To isolate the effect of SI on student performance to determine its significance.

Selected interventions: Study skills; note-taking; test-taking; team building; instructional techniques.

Program description: SI as developed by D.C. Martin at University of Missouri-Kansas City. In the context of a calculus discussion group, the experiment provided 83 students with the following (in addition to the assistance normally provided in discussion groups):

- group work on practice tests
- advice on test preparation
- post-examination surveys about in-class tests
- models and instruction sheets on note-taking.

Evidence of program's success: The 50 students who attended at least 60 percent of the SI sessions performed better than the 51 students who attended at least 60 percent of the discussion sessions without SI. They received a higher mean course grade in first-semester business calculus, and they earned a higher mean semester grade point average. These differences were statistically significant, even when adjusted for the effect of mathematics aptitude, prior academic achievement, and attendance rate.

Information source(s): Kenney, Patricia A. (1989). Effects of Supplemental Instruction on Student Performance in a College-Level Mathematics Course. Paper presented at the 1989 Annual Meeting of the American Educational Research Association, San Francisco, CA, March 1989.

APPENDIX C

FIRST-ROUND INSTRUMENT

Delphi Study to develop a conceptual framework for a campus-wide student retention program for minority-serving institutions

In this packette you should find:

1) **Instructions**
2) **Part I: Conceptual Framework for Retention**
3) **Part II: Delphi Response Instrument**
4) **Return Mailing Information and Materials**

If you are missing any of this information, please call Scott Swail immediately at (202) 393-8320.

Instructions

I want to thank you again for taking part in this research project. The Delphi panel is composed of national experts in areas of student retention, cultural diversity and multiculturalism in higher education, and science, engineering, and mathematics instruction. The validity of this project is largely dependent upon the feedback from this group. A complete list of the participants will be disseminated after the two Delphi rounds have been completed.

At this stage, I will clarify some of my expectations and establish some guidelines to your approach to this first round document. When reviewing the enclosed documents, please:

- Use the response section to record all information regarding the theory and framework.
- Provide both positive and negative feedback regarding all aspects of this document. Both are important.
- Make whatever revisions, deletions, or additions to the framework as you feel are necessary. Please feel free to provide input through illustrative methods or by written comments.
- Provide a citation or reference to support your comment or suggestion (If possible). (e.g., the addition of a student tracking system is supported by several researchers, including Tinto (1993), Astin (1982), etc.).

Upon completion of your task, please follow the instructions regarding return mailing. All materials have been provided to expedite this procedure. Upon return of the Round One instrument from the Delphi Panel, participants may expect the second round to be delivered within approximately three weeks (earlier if possible), depending upon the timely return of first-round materials. Thank you for your interest and support. If you have any questions or require clarification, please call me at (202) 393-8320 (bus) or (703) 730-5068 (res). Good luck in round one!

Mailing Information and Materials

Please insert the completed Delphi Response Instrument (Section 2 *only*) into the enclosed mailing envelope and mail as promptly as possible. Postage has been provided to ensure proper and efficient delivery. If you have any questions, please call me at (202) 393-8320 or (703) 730-5068.

1

Conceptual Framework for Retention

This section contains five (5) parts:

Part I	Theory of Student Persistence and Academic Achievement
Part II	Institutional Components for Student Persistence
Part III	Timeline of Intervention/Activity
Part IV	Program Development
Part V	Program Leadership and Coordination

The theory and framework described in this section were developed by the researcher with information extracted from an extensive review of the literature. The contents of this section are to be the focus of your comments in the enclosed response instrument. Your task is to read this section carefully and prepare for commenting in the next section. **Please do not comment in this section.**

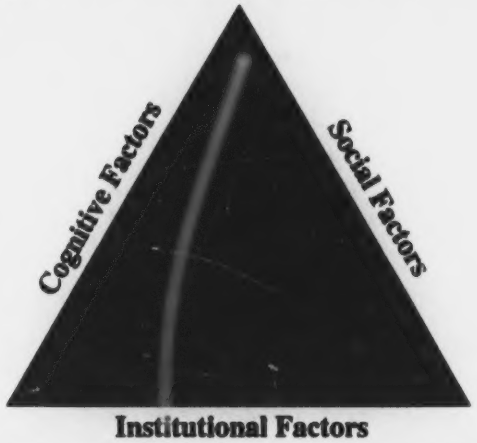
Part I: Theory of Student Persistence and Academic Achievement

Based upon previous studies, theories, and literature reviews, the following theory was developed to help explain the complex phenomena of student persistence and performance in higher education. Three main forces identified in the model include cognitive, social, and institutional forces (See Figure 1).

Cognitive Factors. The cognitive factors relate to the academic preparedness, knowledge, and ability that a student brings with him/her to the college environment. Such factors may include course selection and completion in high school, student aptitude, and extracurricular involvement in academic-related areas (especially for science, engineering, and math students). Cognitive factors are directly related to the student's ability to comprehend and complete the academic portion of the college curriculum.

Social Factors. The second factor related to student persistence and performance are the social factors. These factors describe the student from a social standpoint. Factors that support or impede a student's persistence in college may include parental and peer support, the development or existence of career goals, educational legacy, and the ability to cope in social situations. The importance of social factors to student growth and ability at the college level is a more recent acknowledgment, but nonetheless, a vitally important aspect of student persistence and performance.

Figure 1. Factors Related to Student Persistence



Institutional Factors. The third related set of factors are institution-based. This side of the triangle relates to the ability of the institution to provide appropriate support to students during the college years, both academically and socially. Issues related to course availability, content, and instruction affect the ability of a student to persist, as do the support mechanisms, such as tutoring, mentoring and career counseling, among others.

Figures 1 and 2 are graphic representations of a theory which incorporates the three sets of factors just described. This triangular structure allows for a very detailed discussion regarding the specific factors and their relation to persistence as well as the interplay between these factors. In particular, there are two main issues that this model represents: Time and Stability.

Time

The model allows for a representation of student attributes and ability in relation to time, where the center of the triangle is the present, the sides of the triangle represent the time of matriculation to college, and the area beyond the triangle represents all influences and experiences before college. The matriculation line is an important aspect of this model, as it becomes a snapshot of a student's cognitive and social attributes at entry into college. This is an important consideration for colleges because it expresses the importance of understanding the student before matriculation. In terms of this model, while the area beyond the triangle represents pre-college experiences, the area within the triangle represents the college experience, and all experiences within that space either build upon or alleviate factors that occurred before matriculation.

This model assumes the need for a comprehensive student monitoring system. Without such a

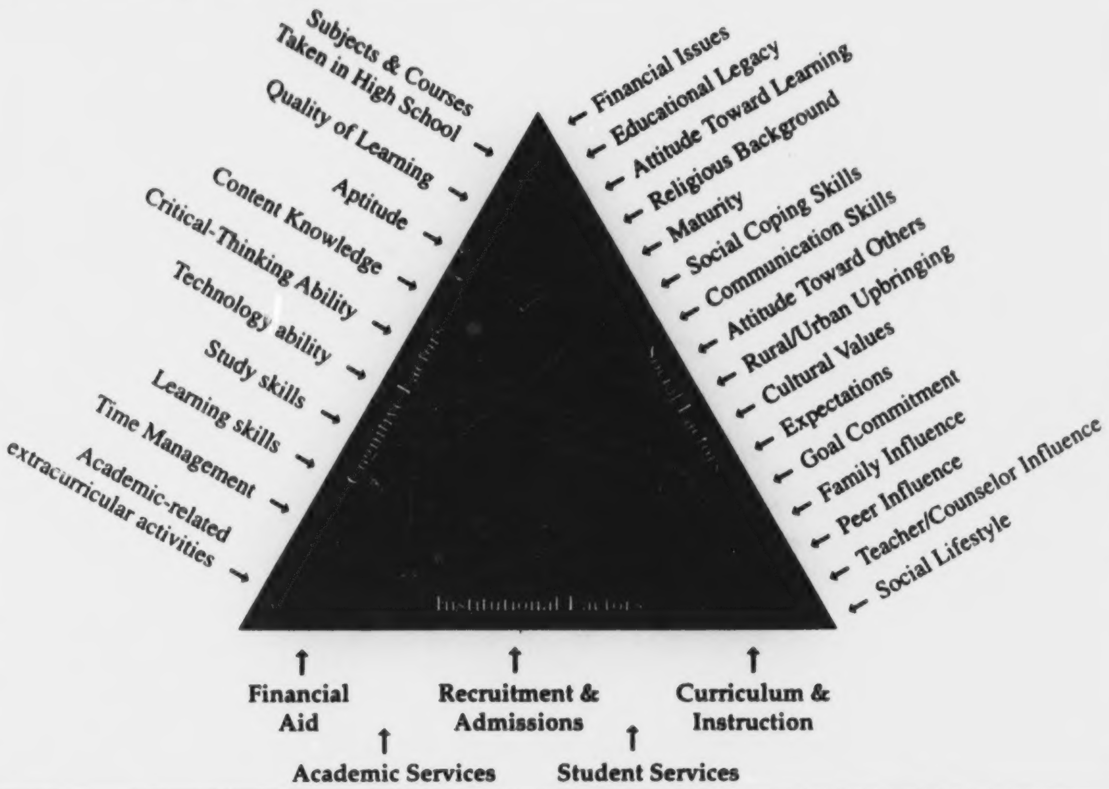


Figure 2. Factors Related to Student Persistence and Performance

Subjects & Courses Taken in High School
Quality of Learning
Aptitude
Content Knowledge
Critical-Thinking Ability
Technology ability
Study skills
Learning skills
Time Management
Academic-related extracurricular activities
Financial Issues
Educational Legacy
Attitude Toward Learning
Religious Background
Maturity
Social Coping Skills
Communication Skills
Attitude Toward Others
Rural/Urban Upbringing
Cultural Values
Expectations
Goal Commitment
Family Influence
Peer Influence
Teacher/Counselor Influence
Social Lifestyle
Cognitive Factors
Social Factors
Institutional Factors
Financial Aid
Recruitment & Admissions
Curriculum & Instruction
Academic Services
Student Services

system, the institution is unable to match the support services with the individual needs of the student. Measurement of student ability at the outset of their college experience, either through testing, interviews, or others methods, provides information for the institution regarding the development and dissemination of institutional support. In addition, this knowledge also can be used in program assessment. Therefore, in mathematical terms, the existence of a complex student monitoring system is a "given" in terms of this study.

Stability

The geometry of student persistence and performance is very complex due to the multitude of factors impacting on each side of the triangle. However, the model helps describe this complex phenomena through a theory of equilibrium. Simply put, the triangle represents the interaction of factors and forces on the student which either support or dissuade the student from persisting in college. When the three forces act with and against each other in a state of equilibrium the student has the appropriate level of support to persist (note: this does not infer that the student *will* persist). When the model falls out of equilibrium, such as when the cognitive forces are so weak as to destroy the stability of the triangle, persistence and performance declines.

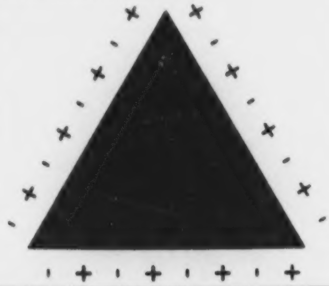
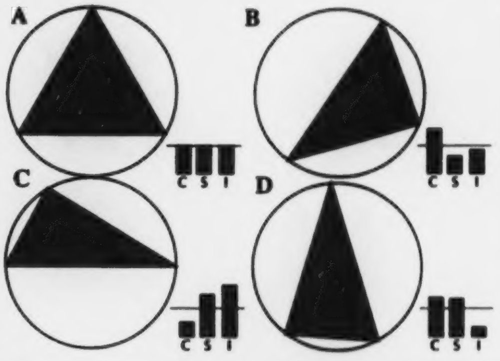


Figure 3. Positive and Negative Factor-effect on the College Persistence Model.

The discussion of factor effect on the model (or student) is twofold. First is the individual factor-effect on each side of the triangle. The individual factors related to each side (e.g., academic ability) are charged either positively or negatively, depending upon their net effect toward student persistence and performance. As can be seen in Figure 3, the combination of these factors, as defined by the use of (+) and (-) symbols, show that there is a push-pull effect on the stability of the triangle. An example of this effect on the cognitive side could be the plus factor of a student's relatively high knowledge of chemistry added to the negative factor of poor SAT scores due to test-taking ability. Thus, the net affect of the cognitive factors would be inconsistent, and in some cases, negated.

Figure 4. Variations on the College Persistence Model



Although balance may be achieved on each side of the triangle, there is rarely an equal balance between the three sides of the model. However, it should not be assumed that an equilateral triangle is the best or only representation that supports student persistence. Rather, a number of variations can be defined based upon the personal attributes of individual students and the applied support from the institution. Figure 4 illustrates four variations including the equilateral variation that would support student persistence. Figure 4(a) represents a situation where the student has an equal cognitive and social ability, and requires a corresponding institutional commitment to aid their persistence and performance. The other three illustrations show an unequal level of student ability and institutional support. For instance, Figure 4(b) shows a student with a high level of cognitive ability, but a lower social ability. Figure 4(c) illustrates a student with poor academic preparation, but excellent social ability and support. In these two cases, the institution must provide support services to promote student persistence. However, in Figure 4(d), the need for institutional intervention is minimal. This graphic illustrates a student with extremely high cognitive and social ability, therefore negating much of the need for institutional support beyond those related to basic instruction.

These graphics illustrate variations that support student persistence. What is important to note is that the stability of the model is more likely to disintegrate when one side of the triangle is forced to overcompensate for too many negative factors attributed to the other two sides of the triangle. Thus, a student with low cognitive abilities and low social abilities is not likely to persist in college regardless of what the institution may provide in terms of support services.

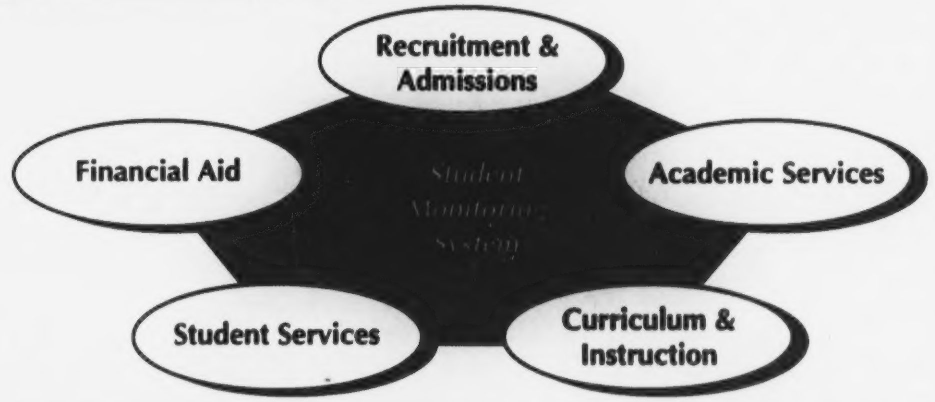
In summary, student persistence and performance is based on the three major areas: the cognitive ability of a student, the social ability of a student, and the institutional support structure to provide service in both the cognitive and social areas. Realizing that each student is uniquely different, the support structures, from an institutional perspective, must remain flexible enough to provide the appropriate forms of support to service a broad spectrum of student populations.

The theory of persistence just introduced provides the foundation for the remainder of this first round Delphi Study. This study will focus on the institutional components that support the cognitive and social components suggested in the theory, as these interventions and support mechanisms are the only methods in which institutions can alter the progress of students in college.

Part II: Institutional Components for Student Persistence

In the literature review, I identified five important institutional support factors which will form the framework for this study (Figure 5). Services provided through these five areas may benefit students by alleviating pressures related to their cognitive and social development. In particular, the five components include financial aid, recruitment and admissions, academic services, student services, and curriculum and instruction. Although some of these components parallel the departmental titles at many universities, they should not be looked at explicitly as departments, but rather, as areas of importance in supporting the needs of students on campus. During your review of this framework, you may decide that other components should also be identified and raised to the level of the original five components.

Figure 5. Institutional Components for Student Persistence

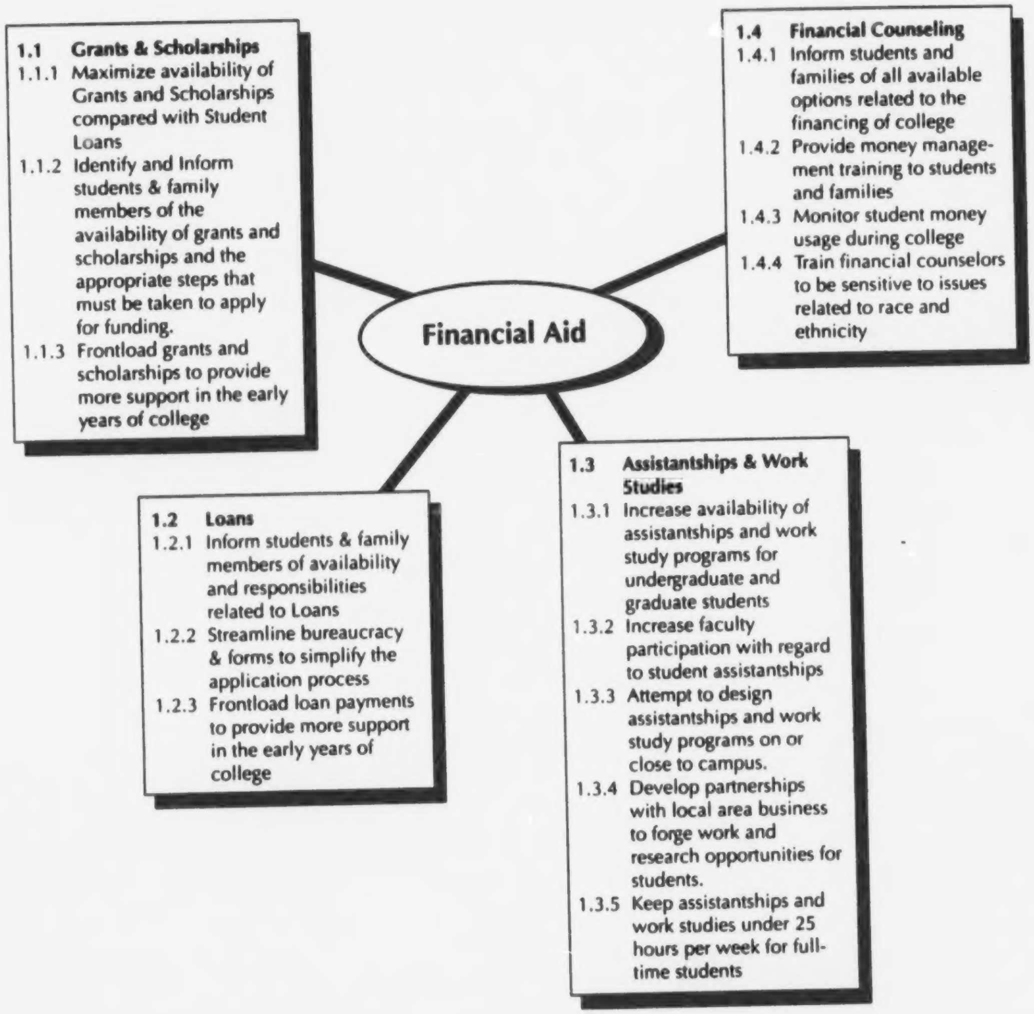


In Figure 5 you will notice that at the hub of the illustration is a "Student Monitoring System." I believe that none of the five components illustrated above can be effective without a comprehensive system of monitoring the academic and social growth of students prior to, during, and after their college experience. The importance of monitoring student development before and after college becomes important in determining the development, implementation, and assessment of interventions and services. The monitoring of student development during college is an important part of a successful early warning system for dropout while also providing a method of fine tuning programs and services during their progress. Therefore, the student monitoring system is placed at the hub of all institutional service and is considered a "given" for any true reform in student retention.

Financial Aid is an important component relating to the ability of students and families to provide the necessary finance to attend college. Student loans, scholarships, and work studies are all issues to consider. Recruitment and admissions relate to the college's ability to identify, recruit, and admit students whose academic goals are commensurate with the mission of the institution. Considerations include the ability of the institution to market the institution to appropriate populations, provide appropriate orientations for the student and family, and utilize fair and effective methods of assessing incoming students. Academic services must provide interventions to aid the academic development of students. Advising, tutoring, bridging, and research programs are examples of institutional efforts to expand student ability. Curriculum and instruction refers to the development of appropriate course content and instructional methods to encourage cognitive development and support the learning styles of a broad student population. Finally, student services provide the social support structure for the campus, including programs which encourage a positive campus climate promoting learning and excellence.

The following pages illustrate the sub-components identified in the literature that may support minority student persistence and performance in science, engineering, and mathematics.

Financial Aid



Financial Aid

1.1 Grants & Scholarships
- 1.1.1 Maximize availability of Grants and Scholarships compared with Student Loans
- 1.1.2 Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.
- 1.1.3 Frontload grants and scholarships to provide more support in the early years of college

1.2 Loans
- 1.2.1 Inform students & family members of availability and responsibilities related to Loans
- 1.2.2 Streamline bureaucracy & forms to simplify the application process
- 1.2.3 Frontload loan payments to provide more support in the early years of college

1.3 Assistantships & Work Studies
- 1.3.1 Increase availability of assistantships and work study programs for undergraduate and graduate students
- 1.3.2 Increase faculty participation with regard to student assistantships
- 1.3.3 Attempt to design assistantships and work study programs on or close to campus.
- 1.3.4 Develop partnerships with local area business to forge work and research opportunities for students.
- 1.3.5 Keep assistantships and work studies under 25 hours per week for full-time students

1.4 Financial Counseling
- 1.4.1 Inform students and families of all available options related to the financing of college
- 1.4.2 Provide money management training to students and families
- 1.4.3 Monitor student money usage during college
- 1.4.4 Train financial counselors to be sensitive to issues related to race and ethnicity

Component **Rationale**

FINANCIAL AID

1.1 Grants & Scholarships

1.1.1	Maximize availability of Grants and Scholarships compared with Student Loans	Grants have been found to be positively related to student persistence, while loans may have a negative correlation to persistence.
1.1.2	Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.	Many students and family members are unaware of the availability of grants and scholarships. Early knowledge (pre-high school) may allow families to plan or prepare for opportunities.
1.1.3	Frontload grants and scholarships to provide more support in the early years of college	Students usually require more funding in the freshman and sophomore years than during the junior and senior years of college

1.2 Loans

1.2.1	Inform students & family members of availability and responsibilities related to Loans	The lack of knowledge regarding loans on behalf of students and parents may be related to the negative attitude towards accepting loans.
1.2.2	Streamline bureaucracy & forms to simplify the application process	The tedious forms that come with most student-aid packages often deter students from completing and submitted applications.
1.2.3	Frontload loan payments to provide more support in the early years of college	Students usually require more funding in the freshman and sophomore years than during the junior and senior years of college

1.3 Assistantships & Work Studies

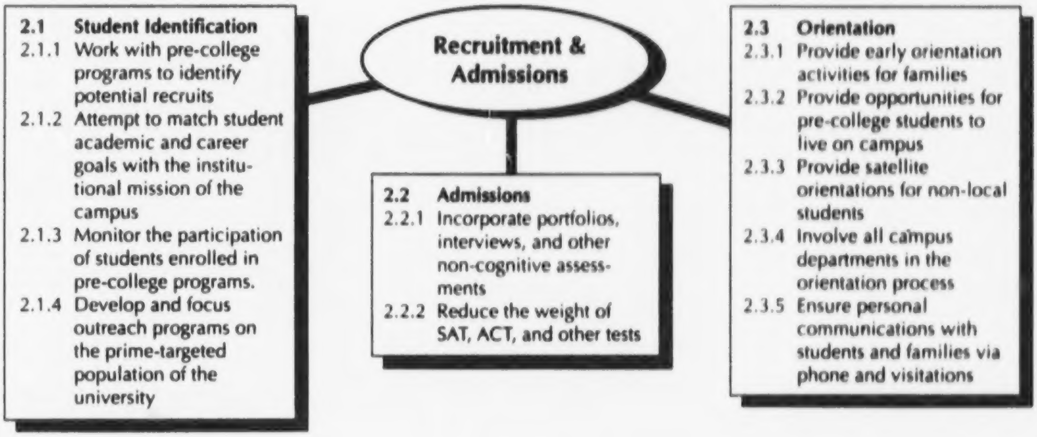
1.3.1	Increase availability of assistantships and work study programs for undergraduate and graduate students	Studies have found that assistantships and work study programs within the major field of study is possitively related to student persistence.
1.3.2	Increase faculty participation with regard to student assistantships	Faculty involvement with students is a vital component of student persistence. The apprenticeship or assistantship opportunity may be a critical factor in the persistence of many students.
1.3.3	Attempt to design assistantships and work study programs on or close to campus.	Work study programs off campus, and especially those beyond the scope of the major field of study, may alter the focus of study and create a barrier between the university and the student, therefore decreasing persistence
1.3.4	Develop partnerships with local area business to forge work and research opportunities for students.	The support of local businesses can add to the real-world applicability of a program while also allowing students to experience hands-on application of their academic knowledge.
1.3.5	Keep assistantships and work studies under 25 hours per week for full-time students	Research has shown that work studies over 25 hours (and some suggest 20 hours) can negatively affect student persistence.

1.4 Financial Counseling

1.4.1	Inform students and families of all available options related to the financing of college	Students and family members should be advised well before matriculation (middle school or earlier) regarding the options and planning related to college finance

	Component	Rationale
1.4.2	Provide money management training to students and families	Generally speaking, students are very poor money managers. The counseling process should take proactive steps in educating students and families regarding the costs of college and appropriate methods of saving and spending
1.4.3	Monitor student money usage during college	Colleges should closely monitor how students spend financial aid money to ensure that students do not over- *or* underextend themselves.
1.4.4	Train financial counselors to be sensitive to issues related to race and ethnicity	The diverse racial and ethnic populations require counselors who are cognizant of specific issues relating to those populations to fully understanding the background and significance of their financial plight.

Recruitment & Admissions



Recruitment & Admissions

2.1 Student Identification

- 2.1.1 Work with pre-college programs to identify potential recruits
- 2.1.2 Attempt to match student academic and career goals with the institutional mission of the campus
- 2.1.3 Monitor the participation of students enrolled in pre-college programs.
- 2.1.4 Develop and focus outreach programs on the prime-targeted population of the university

2.2 Admissions

- 2.2.1 Incorporate portfolios, interviews, and other non-cognitive assessments
- 2.2.2 Reduce the weight of SAT, ACT, and other tests

2.3 Orientation

- 2.3.1 Provide early orientation activities for families
- 2.3.2 Provide opportunities for pre-college students to live on campus
- 2.3.3 Provide satellite orientations for non-local students
- 2.3.4 Involve all campus departments in the orientation process
- 2.3.5 Ensure personal communications with students and families via phone and visitations

Component **Rationale**

RECRUITMENT AND ADMISSIONS

2.1 Student Identification

2.1.1	Work with pre-college programs to identify potential recruits	The pre-college programs developed by colleges are excellent methods of recruiting and monitoring students during their elementary, middle, and high school years.
2.1.2	Attempt to match student academic and career goals with the institutional mission of the campus	Substantial research suggests that the correlation between student goals and those of the institution are critical factors related to the persistence and satisfaction of students during college.
2.1.3	Monitor the participation of students enrolled in pre-college programs.	Monitoring students can aid in further efforts to support academic and social weaknesses in preparation for post-secondary education.
2.1.4	Develop and focus outreach programs on the prime-targeted population of the university	An institution will have better success when recruitment efforts are focused on the main population(s) that attend the institution, rather than blanket approaches for all populations.

2.2 Admissions

2.2.1	Incorporate portfolios, interviews, and other non-cognitive assessments	Although SATs and other testing devices still are regarded as the best predictors of success in college, non-cognitive instruments provide additional information regarding students that is important to the admission process.
2.2.2	Reduce the weight of SAT, ACT, and other tests	More consideration should be given to portfolios and interviews rather than standardized tests to allow for individualism and specific talents.

2.3 Orientation

2.3.1	Provide early orientation activities for families	Families should be oriented to the campus in addition to the student. Early opportunities will provide incentive and information for families to plan for college attendance.
2.3.2	Provide opportunities for pre-college students to live on campus	Allowing students to visit and live on campus before matriculation will allow them to experience the college atmosphere and environment, therefore reducing freshman-year stress.
2.3.3	Provide satellite orientations for non-local students	Orientations set up at non-college sites allow out-of-town students to access important information and meet with on-campus staff and faculty.
2.3.4	Involve all campus departments in the orientation process	Students should be acclimated to the entire campus and be introduced to the staff of important programs available to them, including academic support, social services, and others. These departments/areas should have a hand in the planning of the orientation activities.
2.3.5	Ensure personal communications with students and families via phone and visitations	Substantial and personal contact from the university to the student and family is an important factor in establishing a positive, supportive relationship between the two.

Academic Services

3.1 Academic Advising
- 3.1.1 Provide academic advising and counseling for students on regular basis
- 3.1.2 Keep log of student/faculty-staff interactions in a computerized monitoring system
- 3.1.3 Use faculty for the academic advising students when possible
- 3.1.4 Provide appropriate training in academic advising for faculty

3.6 Bridging Programs
- 3.6.1 Provide summer academic and social support for admitted students before the commencement of the freshman year
- 3.6.2 Provide on-campus residency for students during bridging programs
- 3.6.3 Monitor all student progress in bridging programs

3.5 Pre-College Programs
- 3.5.1 Develop pre-college programs at the elementary and secondary education levels
- 3.5.2 Offer pre-college programs on and off-campus
- 3.5.3 Monitor student progress in pre-college programs.

Academic Services

3.2 Supplementary Instruction
- 3.2.1 Incorporate a variety of instructional methods to support student learning
- 3.2.2 Offer supplementary courses that focus on academic support skills
- 3.2.3 Utilize peers as instructional personnel for supplementary instruction when possible to assist students
- 3.2.4 Encourage the use of peer study groups to foster learning and incorporate more labs with classwork
- 3.2.5 Monitor all supplementary instruction activities by students and log into the computerized database

3.3 Tutoring/Mentoring
- 3.3.1 Provide regularly scheduled and easy access tutoring for students with regard to course work
- 3.3.2 Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors
- 3.3.3 Encourage peer tutoring and group studying within class population
- 3.3.4 Encourage faculty to support the academic needs of students outside of class time
- 3.3.5 Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.

3.4 Research Opportunities
- 3.4.1 Support faculty to work with students on research projects
- 3.4.2 Integrate regular research activities into curricula
- 3.4.3 Develop industry partners for research opportunities
- 3.4.4 Encourage business and industry to participate on campus through in-class demonstrations and experiments

ACADEMIC SERVICES

3.1 Academic Advising

3.1.1	Provide academic advising and counseling for students on regular basis	Regularly scheduled and unscheduled meetings with students will provide both students and institution with continued communication and an assurance that the academic needs of the student are being met.
3.1.2	Keep log of student/faculty-staff interactions in a computerized monitoring system	Create coding system for scheduled (and perhaps non-scheduled) student interactions and enter into computer database to monitor student progress and aid a early warning system of student needs.
3.1.3	Use faculty for the academic advising students when possible	Using faculty for academic advising further develops the role-model effect of a faculty member on students.
3.1.4	Provide appropriate training in academic advising for faculty	Although faculty members may be well versed in areas related to their discipline, they must also be knowledgeable of university regulations, degree requirements, career opportunities, and sensitive to the needs of the college student.

3.2 Supplementary Instruction

3.2.1	Incorporate a variety of instructional methods to support student learning	People incorporate a number of learning styles during their attainment of knowledge. College courses and supplementary instructional courses should attempt to offer assistance by incorporating a multitude of styles to meet the particular needs of the individual.
3.2.2	Offer supplementary courses that focus on academic support skills (e.g., study skills, note taking, listening, writing, reading, time management) and academic content (e.g., biology, calculus, etc.)	Common deficiencies in student ability upon their arrival at college include their underpreparedness in academic ability and their lack of study skills and other necessary skills to support learning and persistence. Institutions must provide opportunities for students to further develop these areas.
3.2.3	Utilize peers as instructional personnel for supplementary instruction when possible to assist students	Students often relate well to peer interaction during supplementary instruction. In addition, the use of peers is a sound budgetary practice.
3.2.4	Encourage the use of peer study groups to foster learning and incorporate more labs with classwork	Students who choose to study together often produce better results academically speaking while also encouraging social integration into the academic community.
3.2.5	Monitor all supplementary instruction activities by students and log into the computerized database	Institutions should monitor student involvement in academic programs to follow their progress and assess individual needs.

3.3 Tutoring/Mentoring

3.3.1	Provide regularly scheduled and easy access tutoring for students with regard to course work	Students should have available accessible tutoring opporunities to support their academic needs. Difficulty in accessing these opportunities may become a barrier to progress.
3.3.2	Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors	The use of peers for tutoring offers students support from students who have recently completed the same course and can offer suggestions and modeling for the student.
3.3.3	Encourage peer tutoring and group studying within class population	The use of students within a particular class as tutors or study group leaders has the benefit of creating a support network within the class.

	Component	**Rationale**
3.3.4	Encourage faculty to support the academic needs of students outside of class time	Faculty involvement, interest, and support outside of class time is important for the academic and social growth of students.
3.3.5	Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.	Minority personnel may offer students a positive role model that they can relate and aspire to.

3.4 Research Opportunities

3.4.1	Support faculty to work with students on research projects	Although faculty involvement in the development and support of student research is important, faculty must be supported by administration for their time and effort in this area.
3.4.2	Integrate regular research activities into curricula	Research activities incorporated into the regular curricular activities may help support the acquisition of higher order thinking skills and motivate students to learn and excell.
3.4.3	Develop industry partners for research opportunities	Utilizing local and regional industry to develop research opportunities for students will help provide real-world experience and motivational opporutnities for students.
3.4.4	Encourage business and industry to participate on campus through in-class demonstrations and experiments	Bringing business and industry on campus further exposes students to real-world linkages, supports the learning process, and assists the development of networks for students.

3.5 Pre-College Programs

3.5.1	Develop pre-college programs at the elementary and secondary education levels	Pre-college programs are excellent opportunities for institutions to offer academic instruction and motivation, while also forging an early relationship between the student and the institution.
3.5.2	Offer pre-college programs on and off-campus	Pre-college programs should be offered off-campus at local schools in order to maximize the number of students involved. However, some programs should bring students on campus to begin to develop and motivate students to aspire to college.
3.5.3	Monitor student progress in pre-college programs.	Beginning student monitoring practices in pre-college programs allows institutions to collect important data regarding student development, supporting future recruitment efforts.

3.6 Bridging Programs

3.6.1	Provide summer academic and social support for admitted students before the commencement of the freshman year	Bridging programs offer students an opportunity to increase their skills and knowledge in academic areas while also introducing them to the campus before the fall semester begins.
3.6.2	Provide on-campus residency for students during briding programs	By allowing students to live on campus for the duration of the bridging program, students will acclimate to the campus and campus life before the fall semester.
3.6.3	Monitor all student progress in bridging programs	Students should be closely monitored and data should be entered into the computer database to facilitate institutional knowledge regarding students.

Curriculum & Instruction

Curriculum & Instruction

4.1 Curriculum Review & Revision

4.1.1 Develop an ongoing review process of curricula utilizing faculty input and outside consultation

4.1.2 Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students

4.1.3 Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction

4.2 Instructional Strategies

4.2.1 Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students

4.2.2 Provide homework, out-of-class assignments, and in-class assignments for students

4.2.3 Utilize educational technologies to complement instruction

4.2.4 Provide appropriate instructional training for teaching faculty

4.3 Assessment Strategies

4.3.1 Conduct extensive student testing and assessment on a regular basis to monitor student progress

4.3.2 Develop assessment instruments that ask students to synthesize and transpose information to new situations

4.3.3 Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences.

4.3.4 Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment

CURRICULUM & INSTRUCTION

4.1 Curriculum Review & Revision

4.1.1	Develop an ongoing review process of curricula utilizing faculty input and outside consultation	Curricula must keep pace with technological innovation, scientific breakthroughs, and theoretical developments in order to remain relevent and provide students with the instruction that will support them in their development.
4.1.2	Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students	College curricula and instruction has traditionally been unmotivating and unrelated to current real-world applications. Today's students need to visualize the impact and relevance of theory.
4.1.3	Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction	The advent of instructional technologies has the ability to change how content is delivered, increase the amount of content delivered, and increase the quality of learning on behalf of students.

4.2 Instructional Strategies

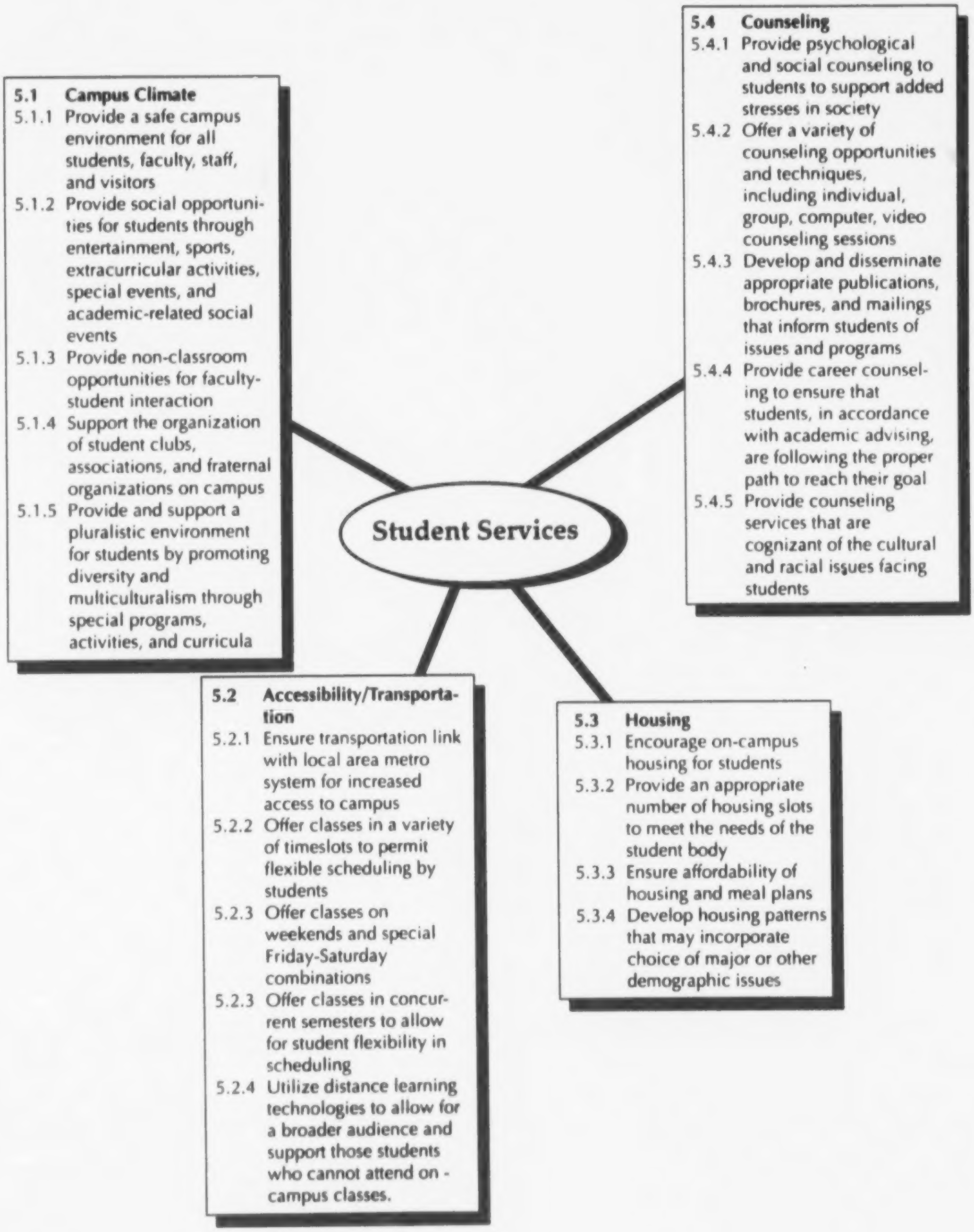
4.2.1	Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students	The traditional methods of college instruction, including the widespread use of lectures, must make way for more innovative and create instructional strategies which engage students and enourage critical thinking and exporatory learning activities.
4.2.2	Provide homework, out-of-class assignments, and in-class assignments for students	Colleges can learn much from K-12 education by using homework assignments, work sheets, and other items and activities to stimulate students and provide a multi-directional learning experience for students (i.e., instruction must incorporate a multi-faceted approach to address student needs).
4.2.3	Utilize educational technologies to complement instruction	Educational technologies, including computer-aided instruction and distance-learning applications, can enhance the learning environment dramatically and allow for opportunities which were perhaps not available before.
4.2.4	Provide appropriate instructional training for teaching faculty	Instructional faculty must be given appropriate training to incorporate new teaching strategies into their courses.

4.3 Assessment Strategies

4.3.1	Conduct extensive student testing and assessment on a regular basis to monitor student progress	Many courses fail to monitor student progress through regular assessment activities. Courses should provide regular assessments of student knowledge and ability to guage both student progress and instructional effectiveness.
4.3.2	Develop assessment instruments that ask students to synthesize and transpose information to new situations	Students must be able to utilize new-found knowledge and ability by illustrating that they can adapt that information to new situations, rather than supply information from rote memorization.

	Component	Rationale
4.3.3	Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.)	The use of a variety of assessment techniques allows for a better description of student ability and does not limit students who happen to perform poor in one aspect of the assessment.
4.3.4	Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment	All assessment activities should be entered into a database to monitor student performance and development. This will allow for early intervention in support of learning and persistence.

Student Services



Student Services

5.1 Campus Climate

5.1.1 Provide a safe campus environment for all students, faculty, staff, and visitors

5.1.2 Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events

5.1.3 Provide non-classroom opportunities for faculty-student interaction

5.1.4 Support the organization of student clubs, associations, and fraternal organizations on campus

5.1.5 Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula

5.2 Accessibility/Transportation

5.2.1 Ensure transportation link with local area metro system for increased access to campus

5.2.2 Offer classes in a variety of timeslots to permit flexible scheduling by students

5.2.3 Offer classes on weekends and special Friday-Saturday combinations

5.2.3 Offer classes in concurrent semesters to allow for student flexibility in scheduling

5.2.4 Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on - campus classes.

5.3 Housing

5.3.1 Encourage on-campus housing for students

5.3.2 Provide an appropriate number of housing slots to meet the needs of the student body

5.3.3 Ensure affordability of housing and meal plans

5.3.4 Develop housing patterns that may incorporate choice of major or other demographic issues

5.4 Counseling

5.4.1 Provide psychological and social counseling to students to support added stresses in society

5.4.2 Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions

5.4.3 Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs

5.4.4 Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal

5.4.5 Provide counseling services that are cognizant of the cultural and racial issues facing students

Component **Rationale**

STUDENT SERVICES

5.1 Campus Climate

5.1.1	Provide a safe campus environment for all students, faculty, staff, and visitors	All inhabitants of the campus must feel safe during their stay. Without such assurance, social and academic development are likely to be hindered.
5.1.2	Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events	The college experience represents more than the academic development of students. The institution must also consider and foster the social development of the student, and provide opportunities for this development.
5.1.3	Provide non-classroom opportunities for faculty-student interaction	Research has shown that faculty-student interaction is an important aspect of college life. Institutions should promote this concept and encourage faculty to become more involved in student life through administrative support.
5.1.4	Support the organization of student clubs, associations, and fraternal organizations on campus	Student organizations can positively enhance the college experience and indirectly and direclty promote the learning process.
5.1.5	Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula	All activities on campus, academic and social, should promote cultural diversity to create a positive learning environment for students that respects the individual.

5.2 Accessibility/Transportation

5.2.1	Ensure transportation link with local area metro system for increased access to campus	Off-campus students must be provided with adequate transportation opportunities to encourage student persistence.
5.2.2	Offer classes in a variety of timeslots to permit flexible scheduling by students	The practice of standardizing the scheduling process at universities, barriers have been raised that dissuade students from attending certain classes. For example, a gatekeeper course offered only in the early morning session may not allow some students to attend because of the commute problems, scheduling conflicts, or work schedules.
5.2.3	Offer classes on weekends and special Friday-Saturday combinations	Classes scheduled on weekends offer students another possibility to attend classes.
5.2.3	Offer classes in concurrent semesters to allow for student flexibility in scheduling	The practice of alternating some course offerings can create major scheduling problems for students including the extension of their college experience due to the unavailability of certain classes.
5.2.4	Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on -campus classes.	Distance-learning applications can allow students to attend class from either a satellite site or even from home, giving even more flexibility for students regarding scheduling and college attendance.

5.3 Housing

5.3.1	Encourage on-campus housing for students	Students who live on campus tend to have higher persistence rates and are more involved in the social and academic environment.

	Component	Rationale
5.3.2	Provide an appropriate number of housing slots to meet the needs of the student body	Institutions that cannot provide the necessary amount of student housing force students to live off campus, removing them from the campus experience.
5.3.3	Ensure affordability of housing and meal plans	Considering the difficulty students have in financing tuition, additional costs related to room and board must be controlled such that they do not dissuade college attendance.
5.3.4	Develop housing patterns that may incorporate choice of major or other demographic issues	Some colleges have found that creating housing sections based on academic discipline, social organization, or even race/ethnicity, have been correlated with student persistence and performance.

5.4 Counseling

5.4.1	Provide psychological and social counseling to students to support added stresses in society	Today's college students face more uncertainties than previous generations and require a comprehensive social support systems to meet their needs.
5.4.2	Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions	The diverse social and psychological needs of students can be met through a variety of counseling services, offering support for students in a comfortable environment
5.4.3	Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs	Services offered at a college or university may be largely uneffective if they are not marketed properly to the student body. Counseling services, as with other student services, must be made known to students in a positive and supportive light.
5.4.4	Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal	The university should ensure that a student is enrolled in the appropriate program and classes to meet the career goals of that student. In addition, career counseling should also allow for the analysis of student aptitude and help students generate career goals.
5.4.5	Provide counseling services that are cognizant of the cultural and racial issues facing students	Counseling services must be particularly attune to the cultural and racial issues that students must deal with on a daily basis, and provide support and assistance in dealing with those issues.

PART III: Timeline of Intervention/Activity

TIMELINE OF INTERVENTION		Elem	MS	HS	Summer	Fresh	Soph	Junio	Sr.+
	School Year	5	8	12		13	14	15	16
FINANCIAL AID									
1.1	**Grants & Scholarships**				■	■	■	■	■
1.2	Loans				■	■	■	■	■
1.3	**Assistantships & Work Studies**					■	■	■	■
1.4	Financial Counseling		■	■	■	■	■	■	■
RECRUITMENT AND ADMISSIONS									
2.1	**Student Identification**	■	■	■	■	■	■	■	■
2.2	Admissions			■	■				
2.3	**Orientation**			■	■	■			
ACADEMIC SERVICES									
3.1	Academic Advising			■	■	■	■	■	■
3.2	**Supplementary Instruction**				■	■	■	■	■
3.3	Tutoring/Mentoring				■	■	■	■	■
3.4	**Research Opportunities**					■	■	■	■
3.5	Pre-College Programs	■	■	■					
3.6	**Bridging Programs**				■				
CURRICULUM & INSTRUCTION									
4.1	Curriculum Review & Revision					■	■ ONGOING	■	■
4.2	**Instructional Strategies**					■	■ ONGOING	■	■
4.3	Assessment Strategies					■	■ ONGOING	■	■
SOCIAL SERVICES									
5.1	**Campus Climate**					■	■	■	■
5.2	Accessibility/Transportation				■	■	■	■	■
5.3	**Housing**				■	■	■	■	■
5.4	Counseling				■	■	■	■	■
STUDENT MONITORING			■	■	■	■	■	■	■

PART IV: Program Development

Before the stages of program development can be introduced, it is essential that some guidelines be recommended for the development and implementation of a campus-wide retention effort.

A comprehensive student retention program must:

- **be based on proven research**
- **suit the particular needs of the campus**
- **be institutionalized and become a regular part of campus service**
- **involve all campus departments and all campus personnel**
- **take into consideration the dynamics of the change process and**
- **provide extensive and appropriate retraining of staff**
- **be student-centered**
- **be cost effective, and not reliant on soft monies**
- **be supported by a comprehensive student monitoring system that will become the foundation of all institutional research on campus and support every department**
- **be sensitive to student needs and to diverse populations**

The development of a campus-wide retention program requires: (a) supportive leadership; (b) the willingness to evoke change on campus; and (c) a careful planning effort. If either of these essential factors are missing, it is doubtful that any progress will be made. Once institutions have ensured that the climate for change exists and the support and guidance of campus leadership is present, the following stages may provide guidance during the planning and development of the retention effort.

Stage 1 - Pre-Planning

The pre-planning stage is a research phase in which the university conducts a campus-wide needs assessment. During this initial stage, the institution must:

1. Analyze the size and scope of retention issue on campus
2. Identify student needs on campus
3. Assess the status and effectiveness of current retention strategies and programs on campus
4. Identify institutional resources that may be utilized or redirected
5. Identify successful retention strategies at other campuses

Stage 2 - Planning

The planning stage is the longest stage of the developmental process, as special care must be taken to involve the entire campus in the creation of the program. The planning stage must carefully assess the research conducted in Stage 1, develop a redefined institutional mission and goals, and develop an appropriate retention plan that bridges those two components. The main activities of Stage 2 include:

1. The development of organizational strategies
2. The identification of key stakeholders on/off campus and their roles within the retention process
3. The refinement or enhancement of the college mission statement and goals
4. The assessment, presentation, and discussion of Pre-Planning data
5. The development of retention program components and operation strategies
6. Development of implementation plan

Stage 3 - Implementation

The implementation of the retention programs and strategies designed in Stage 3 follows the schedule and plan devised that should also have been carefully developed during that stage. The administration must provide resource support during the implementation stage for any unforeseen circumstances and difficulties encountered.

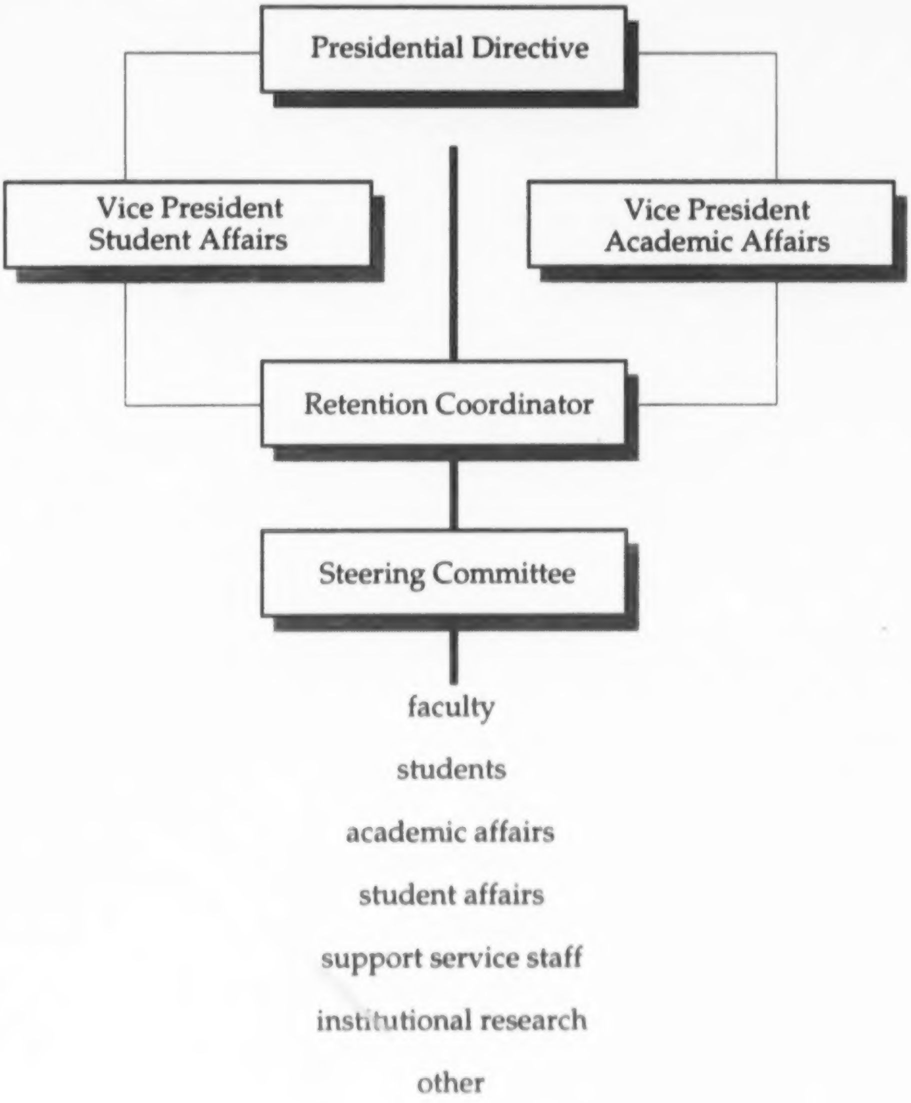
Stage 4 - Program Monitoring

The monitoring of the retention program is an essential practice that must be entrenched in the design of the system. Without the careful planning of an assessment strategy, the true value and effect of the program components can never be measured. The monitoring system should provide ongoing data to all campus personnel involved in the operation of the retention effort. The main practices that must be conducted include:

1. Data collection and analysis of program components and student performance
2. Dissemination of data to stakeholders
3. Ensure that conclusions based on program monitoring are incorporated in program revisions

PART V: Program Leadership and Coordination

The following chart was developed by Beal & Noel (1980). Please give your reaction to the organization and placement of personnel on this management chart.


Presidential Directive
Vice President Student Affairs
Vice President Academic Affairs
Retention Coordinator
Steering Committee
faculty
students
academic affairs
student affairs
support service staff
institutional research
other

2

Delphi Response Instrument

This section contains five (5) response areas paralleling those introduced in the Conceptual Framework:

Part I	Theory of Student Persistence and Academic Achievement
Part II	Institutional Components of Retention
Part III	Timeline of Intervention/Activity
Part IV	Program Development
Part V	Program Leadership and Coordination

Use this section to apply your comments to. In this document, you should:

- **Select the appropriate number** on the Likert scale next to the component that best represents the importance of that component.
- **Add appropriate comments** that either support, negate, or build upon the concept illustrated.
- **Add new components/considerations** that you feel are missing from the framework. You may also utilize the accompanying graphic to illustrate your comments.
- Whenever possible, **provide citations** to support your claim.

IMPORTANT

The comments that you add are perhaps the most important aspect of this study, as they generate the substance and foundation for the framework. Please do not neglect this area.

Part I: Theory of Student Persistence and Academic Achievement

Please add any comments you may have regarding the theory of student persistence (pages 2-4 of main document) on this page.

Part II: Institutional Components for Student Persistence

FINANCIAL AID

Financial Aid

1.1 Grants & Scholarships

1.1.1 Maximize availability of Grants and Scholarships compared with Student Loans

1.1.2 Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.

1.1.3 Frontload grants and scholarships to provide more support in the early years of college

1.2 Loans

1.2.1 Inform students & family members of availability and responsibilities related to Loans

1.2.2 Streamline bureaucracy & forms to simplify the application process

1.2.3 Frontload loan payments to provide more support in the early years of college

1.3 Assistantships & Work Studies

1.3.1 Increase availability of assistantships and work study programs for undergraduate and graduate students

1.3.2 Increase faculty participation with regard to student assistantships

1.3.3 Attempt to design assistantships and work study programs on or close to campus.

1.3.4 Develop partnerships with local area business to forge work and research opportunities for students.

1.3.5 Keep assistantships and work studies under 25 hours per week for full-time students

1.4 Financial Counseling

1.4.1 Inform students and families of all available options related to the financing of college

1.4.2 Provide money management training to students and families

1.4.3 Monitor student money usage during college

1.4.4 Train financial counselors to be sensitive to issues related to race and ethnicity

FINANCIAL AID

Not Important Important

1.1 Grants & Scholarships

	Component	Rationale	Not Important			Important
1.1.1	Maximize availability of Grants and Scholarships compared with Student Loans	Grants have been found to be positively related to student persistence, while loans may have a negative correlation to persistence.	1	2	3	4
	Comment:					
1.1.2	Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.	Many students and family members are unaware of the availability of grants and scholarships. Early knowledge (pre-high school) may allow families to plan or prepare for opportunities.	1	2	3	4
	Comment:					
1.1.3	Frontload grants and scholarships to provide more support in the early years of college	Students usually require more funding in the freshman and sophomore years than during the junior and senior years of college	1	2	3	4
	Comment:					
	Additions:					

	Component	Rationale	Not Important			Important

Additions:

1.2 Loans

1.2.1	Inform students & family members of availability and responsibilities related to Loans	The lack of knowledge regarding loans on behalf of students and parents may be related to the negative attitude towards accepting loans.	1	2	3	4
	Comment:					
1.2.2	Streamline bureaucracy & forms to simplify the application process	The tedious forms that come with most student-aid packages often deter students from completing and submitted applications.	1	2	3	4
	Comment:					
1.2.3	Frontload loan payments to provide more support in the early years of college	Students usually require more funding in the freshman and sophomore years than during the junior and senior years of college	1	2	3	4
	Comment:					
	Additions:					
	Additions:					

	Component	Rationale	Not Important			Important
1.3	**Assistantships & Work Studies**					
1.3.1	Increase availability of assistantships and work study programs for undergraduate and graduate students	Studies have found that assistantships and work study programs within the major field of study is possitively related to student persistence.	1	2	3	4
	Comment:					
1.3.2	Increase faculty participation with regard to student assistantships	Faculty involvement with students is a vital component of student persistence. The apprenticeship or assistantship opportunity may be a critical factor in the persistence of many students.	1	2	3	4
	Comment:					
1.3.3	Attempt to design assistantships and work study programs on or close to campus.	Work study programs off campus, and especially those beyond the scope of the major field of study, may alter the focus of study and create a barrier between the university and the student, therefore decreasing persistence	1	2	3	4
	Comment:					
1.3.4	Develop partnerships with local area business to forge work and research opportunities for students.	The support of local businesses can add to the real-world applicability of a program while also allowing students to experience hands-on application of their academic knowledge.	1	2	3	4
	Comment:					
1.3.5	Keep assistantships and work studies under 25 hours per week for full-time students	Research has shown that work studies over 25 hours (and some suggest 20 hours) can negatively affect student persistence.	1	2	3	4

	Component	Rationale	Not Important			Important
	Comment:					
	Additions:					
	Additions:					

1.4 Financial Counseling

1.4.1	Inform students and families of all available options related to the financing of college	Students and family members should be advised well before matriculation (middle school or earlier) regarding the options and planning related to college finance	1	2	3	4
	Comment:					
1.4.2	Provide money management training to students and families	Generally speaking, students are very poor money managers. The counseling process should take proactive steps in educating students and families regarding the costs of college and appropriate methods of saving and spending	1	2	3	4
	Comment:					
1.4.3	Monitor student money usage during college	Colleges should closely monitor how students spend financial aid money to ensure that students do not over- *or* underextend themselves.	1	2	3	4

	Component	Rationale	Not Important			Important
	Comment:					
1.4.4	Train financial counselors to be sensitive to issues related to race and ethnicity	The diverse racial and ethnic populations require counselors who are cognizant of specific issues relating to those populations to fully understanding the background and significance of their financial plight.	1	2	3	4
	Comment:					
	Additions:					
	Additions:					

RECRUITMENT AND ADMISSIONS

Recruitment & Admissions

2.1 Student Identification
- 2.1.1 Work with pre-college programs to identify potential recruits
- 2.1.2 Attempt to match student academic and career goals with the institutional mission of the campus
- 2.1.3 Monitor the participation of students enrolled in pre-college programs.
- 2.1.4 Develop and focus outreach programs on the prime-targeted population of the university

2.2 Admissions
- 2.2.1 Incorporate portfolios, interviews, and other non-cognitive assessments
- 2.2.2 Reduce the weight of SAT, ACT, and other tests

2.3 Orientation
- 2.3.1 Provide early orientation activities for families
- 2.3.2 Provide opportunities for pre-college students to live on campus
- 2.3.3 Provide satellite orientations for non-local students
- 2.3.4 Involve all campus departments in the orientation process
- 2.3.5 Ensure personal communications with students and families via phone and visitations

RECRUITMENT AND ADMISSIONS

Not Important Important

2.1	**Student Identification**					
2.1.1	Work with pre-college programs to identify potential recruits	The pre-college programs developed by colleges are excellent methods of recruiting and monitoring students during their elementary, middle, and high school years.	1	2	3	4
	Comments:					
2.1.2	Attempt to match student academic and career goals with the institutional mission of the campus	Substantial research suggests that the correlation between student goals and those of the institution are critical factors related to the persistence and satisfaction of students during college.	1	2	3	4
	Comments:					
2.1.3	Monitor the participation of students enrolled in pre-college programs.	Monitoring students can aid in further efforts to support academic and social weaknesses in preparation for post-secondary education.	1	2	3	4
	Comments:					
2.1.4	Develop and focus outreach programs on the prime-targeted population of the university	An institution will have better success when recruitment efforts are focused on the main population(s) that attend the institution, rather than blanket approaches for all populations.	1	2	3	4
	Comments:					

	Component	Rationale	Not Important			Important
	Additions:					
	Additions:					

2.2 **Admissions**

2.2.1	Incorporate portfolios, interviews, and other non-cognitive assessments	Although SATs and other testing devices still are regarded as the best predictors of success in college, non-cognitive instruments provide additional information regarding students that is important to the admission process.	1	2	3	4
	Comments:					
2.2.2	Reduce the weight of SAT, ACT, and other tests	More consideration should be given to portfolios and interviews rather than standardized tests to allow for individualism and specific talents.	1	2	3	4
	Comments:					
	Additions:					
	Additions:					

	Component	Rationale	Not Important			Important
2.3	**Orientation**					
2.3.1	Provide early orientation activities for families	Families should be oriented to the campus in addition to the student. Early opportunities will provide incentive and information for families to plan for college attendance.	1	2	3	4
	Comments:					
2.3.2	Provide opportunities for pre-college students to live on campus	Allowing students to visit and live on campus before matriculation will allow them to experience the college atmosphere and environment, therefore reducing freshman-year stress.	1	2	3	4
	Comments:					
2.3.3	Provide satellite orientations for non-local students	Orientations set up at non-college sites allow out-of-town students to access important information and meet with on-campus staff and faculty.	1	2	3	4
	Comments:					
2.3.4	Involve all campus departments in the orientation process	Students should be acclimated to the entire campus and be introduced to the staff of important programs available to them, including academic support, social services, and others. These departments/areas should have a hand in the planning of the orientation activities.	1	2	3	4
	Comments:					
2.3.5	Ensure personal communications with students and families via phone and visitations	Substantial and personal contact from the university to the student and family is an important factor in establishing a positive, supportive relationship between the two.	1	2	3	4

	Component	Rationale	Not Important	Important

Comments:
Additions:
Additions:

ACADEMIC SERVICES

3.1 Academic Advising

3.1 Academic Advising
3.1.1 Provide academic advising and counseling for students on regular basis
3.1.2 Keep log of student/faculty-staff interactions in a computerized monitoring system
3.1.3 Use faculty for the academic advising students when possible
3.1.4 Provide appropriate training in academic advising for faculty

3.6 Bridging Programs

3.6.1 Provide summer academic and social support for admitted students before the commencement of the freshman year
3.6.2 Provide on-campus residency for students during briding programs
3.6.3 Monitor all student progress in bridging programs

3.5 Pre-College Programs

3.5.1 Develop pre-college programs at the elementary and secondary education levels
3.5.2 Offer pre-college programs on and off-campus
3.5.3 Monitor student progress in pre-college programs.

Academic Services

3.2 Supplementary Instruction

3.2.1 Incorporate a variety of instructional methods to support student learning
3.2.2 Offer supplementary courses that focus on academic support skills
3.2.3 Utilize peers as instructional personnel for supplementary instruction when possible to assist students
3.2.4 Encourage the use of peer study groups to foster learning and incorporate more labs with classwork
3.2.5 Monitor all supplementary instruction activities by students and log into the computerized database

3.3 Tutoring/Mentoring

3.3.1 Provide regularly scheduled and easy access tutoring for students with regard to course work
3.3.2 Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors
3.3.3 Encourage peer tutoring and group studying within class population
3.3.4 Encourage faculty to support the academic needs of students outside of class time
3.3.5 Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.

3.4 Research Opportunities

3.4.1 Support faculty to work with students on research projects
3.4.2 Integrate regular research activities into curricula
3.4.3 Develop industry partners for research opportunities
3.4.4 Encourage business and industry to participate on campus through in-class demonstrations and experiments

	Component	Rationale	Not Important			Important

ACADEMIC SERVICES

Not Important Important

3.1 Academic Advising

			Not Important			Important
3.1.1	Provide academic advising and counseling for students on regular basis	Regularly scheduled and unscheduled meetings with students will provide both students and institution with continued communication and an assurance that the academic needs of the student are being met.	1	2	3	4
Comments:						
3.1.2	Keep log of student/faculty-staff interactions in a computerized monitoring system	Create coding system for scheduled (and perhaps non-scheduled) student interactions and enter into computer database to monitor student progress and aid a early warning system of student needs.	1	2	3	4
Comments:						
3.1.3	Use faculty for the academic advising students when possible	Using faculty for academic advising further develops the role-model effect of a faculty member on students.	1	2	3	4
Comments:						
3.1.4	Provide appropriate training in academic advising for faculty	Although faculty members may be well versed in areas related to their discipline, they must also be knowledgeable of university regulations, degree requirements, career opportunities, and sensitive to the needs of the college student.	1	2	3	4
Comments:						

	Component	Rationale	Not Important			Important
Additions:						
Additions:						

3.2 Supplementary Instruction

3.2.1	Incorporate a variety of instructional methods to support student learning	People incorporate a number of learning styles during their attainment of knowledge. College courses and supplementary instructional courses should attempt to offer assistance by incorporating a multitude of styles to meet the particular needs of the individual.	1	2	3	4
Comments:						
3.2.2	Offer supplementary courses that focus on academic support skills (e.g., study skills, note taking, listening, writing, reading, time management) and academic content (e.g., biology, calculus, etc.)	Common deficiencies in student ability upon their arrival at college include their underpreparedness in academic ability and their lack of study skills and other necessary skills to support learning and persistence. Institutions must provide opportunities for students to further develop these areas.	1	2	3	4
Comments:						
3.2.3	Utilize peers as instructional personnel for supplementary instruction when possible to assist students	Students often relate well to peer interaction during supplementary instruction: In addition, the use of peers is a sound budgetary practice.	1	2	3	4

	Component	Rationale	Not Important			Important
Comments:						
3.2.4	Encourage the use of peer study groups to foster learning and incorporate more labs with classwork	Students who choose to study together often produce better results academically speaking while also encouraging social integration into the academic community.	1	2	3	4
Comments:						
3.2.5	Monitor all supplementary instruction activities by students and log into the computerized database	Institutions should monitor student involvement in academic programs to follow their progress and assess individual needs.	1	2	3	4
Comments:						
Additions:						
Additions:						

	Component	Rationale	Not Important			Important
3.3	**Tutoring/Mentoring**					
3.3.1	Provide regularly scheduled and easy access tutoring for students with regard to course work	Students should have available accessible tutoring opporunities to support their academic needs. Difficulty in accessing these opportunities may become a barrier to progress.	1	2	3	4
Comments:						
3.3.2	Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors	The use of peers for tutoring offers students support from students who have recently completed the same course and can offer suggestions and modeling for the student.	1	2	3	4
Comments:						
3.3.3	Encourage peer tutoring and group studying within class population	The use of students within a particular class as tutors or study group leaders has the benefit of creating a support network within the class.	1	2	3	4
Comments:						
3.3.4	Encourage faculty to support the academic needs of students outside of class time	Faculty involvement, interest, and support outside of class time is important for the academic and social growth of students.	1	2	3	4
Comments:						
3.3.5	Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.	Minority personnel may offer students a positive role model that they can relate and aspire to.	1	2	3	4

	Component	Rationale	Not Important			Important

Comments:

Additions:

Additions:

3.4 Research Opportunities

3.4.1	Support faculty to work with students on research projects	Although faculty involvement in the development and support of student research is important, faculty must be supported by administration for their time and effort in this area.	1	2	3	4
Comments:						
3.4.2	Integrate regular research activities into curricula	Research activities incorporated into the regular curricular activities may help support the acquisition of higher order thinking skills and motivate students to learn and excell.	1	2	3	4
Comments:						
3.4.3	Develop industry partners for research opportunities	Utilizing local and regional industry to develop research opportunities for students will help provide real-world experience and motivational opporutnities for students.	1	2	3	4

	Component	Rationale	Not Important			Important
Comments:						
3.4.4	Encourage business and industry to participate on campus through in-class demonstrations and experiments	Bringing business and industry on campus further exposes students to real-world linkages, supports the learning process, and assists the development of networks for students.	1	2	3	4
Comments:						
Additions:						
Additions:						

3.5 Pre-College Programs

3.5.1	Develop pre-college programs at the elementary and secondary education levels	Pre-college programs are excellent opportunities for institutions to offer academic instruction and motivation, while also forging an early relationship between the student and the institution.	1	2	3	4
Comments:						
3.5.2	Offer pre-college programs on and off-campus	Pre-college programs should be offered off-campus at local schools in order to maximize the number of students involved. However, some programs should bring students on campus to begin to develop and motivate students to aspire to college.	1	2	3	4

	Component	Rationale	Not Important			Important
Comments:						
3.5.3	Monitor student progress in pre-college programs.	Beginning student monitoring practices in pre-college programs allows institutions to collect important data regarding student development, supporting future recruitment efforts.	1	2	3	4
Comments:						
Additions:						
Additions:						

3.6 Bridging Programs

3.6.1	Provide summer academic and social support for admitted students before the commencement of the freshman year	Bridging programs offer students an opportunity to increase their skills and knowledge in academic areas while also introducing them to the campus before the fall semester begins.	1	2	3	4
Comments:						
3.6.2	Provide on-campus residency for students during briding programs	By allowing students to live on campus for the duration of the bridging program, students will acclimate to the campus and campus life before the fall semester.	1	2	3	4

	Component	Rationale	Not Important			Important
Comments:						
3.6.3	Monitor all student progress in bridging programs	Students should be closely monitored and data should be entered into the computer database to facilitate institutional knowledge regarding students.	1	2	3	4
Comments:						
Additions:						
Additions:						

CURRICULUM & INSTRUCTION

Curriculum & Instruction

4.1 Curriculum Review & Revision

4.1.1 Develop an ongoing review process of curricula utilizing faculty input and outside consultation

4.1.2 Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students

4.1.3 Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction

4.2 Instructional Strategies

4.2.1 Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students

4.2.2 Provide homework, out-of-class assignments, and in-class assignments for students

4.2.3 Utilize educational technologies to complement instruction

4.2.4 Provide appropriate instructional training for teaching faculty

4.3 Assessment Strategies

4.3.1 Conduct extensive student testing and assessment on a regular basis to monitor student progress

4.3.2 Develop assessment instruments that ask students to synthesize and transpose information to new situations

4.3.3 Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences.

4.3.4 Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment

	Component	Rationale	Not Important			Important

CURRICULUM & INSTRUCTION

Not Important **Important**

4.1 Curriculum Review & Revision

4.1.1	Develop an ongoing review process of curricula utilizing faculty input and outside consultation	Curricula must keep pace with technological innovation, scientific breakthroughs, and theoretical developments in order to remain relevent and provide students with the instruction that will support them in their development.	1	2	3	4
Comments:						
4.1.2	Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students	College curricula and instruction has traditionally been unmotivating and unrelated to current real-world applications. Today's students need to visualize the impact and relevance of theory.	1	2	3	4
Comments:						
4.1.3	Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction	The advent of instructional technologies has the ability to change how content is delivered, increase the amount of content delivered, and increase the quality of learning on behalf of students.	1	2	3	4
Comments:						
Additions:						

	Component	Rationale	Not Important			Important

Additions:

4.2 Instructional Strategies

4.2.1	Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students	The traditional methods of college instruction, including the widespread use of lectures, must make way for more innovative and create instructional strategies which engage students and enourage critical thinking and exporatory learning activities.	1	2	3	4
Comments:						
4.2.2	Provide homework, out-of-class assignments, and in-class assignments for students	Colleges can learn much from K-12 education by using homework assignments, work sheets, and other items and activities to stimulate students and provide a multi-directional learning experience for students (i.e., instruction must incorporate a multi-faceted approach to address student needs).	1	2	3	4
Comments:						
4.2.3	Utilize educational technologies to complement instruction	Educational technologies, including computer-aided instruction and distance-learning applications, can enhance the learning environment dramatically and allow for opportunities which were perhaps not available before.	1	2	3	4
Comments:						
4.2.4	Provide appropriate instructional training for teaching faculty	Instructional faculty must be given appropriate training to incorporate new teaching strategies into their courses.	1	2	3	4

	Component	Rationale	Not Important			Important

Comments:
Additions:
Additions:

4.3 Assessment Strategies

4.3.1	Conduct extensive student testing and assessment on a regular basis to monitor student progress	Many courses fail to monitor student progress through regular assessment activities. Courses should provide regular assessments of student knowledge and ability to guage both student progress and instructional effectiveness.	1	2	3	4
Comments:						
4.3.2	Develop assessment instruments that ask students to synthesize and transpose information to new situations	Students must be able to utilize new-found knowledge and ability by illustrating that they can adapt that information to new situations, rather than supply information from rote memorization.	1	2	3	4
Comments:						

	Component	**Rationale**	**Not Important**			**Important**
4.3.3	Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.)	The use of a variety of assessment techniques allows for a better description of student ability and does not limit students who happen to perform poor in one aspect of the assessment.	1	2	3	4
Comments:						
4.3.4	Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment	All assessment activities should be entered into a database to monitor student performance and development. This will allow for early intervention in support of learning and persistence.	1	2	3	4
Comments:						
Additions:						
Additions:						

STUDENT SERVICES

Student Services

5.1 Campus Climate

- 5.1.1 Provide a safe campus environment for all students, faculty, staff, and visitors
- 5.1.2 Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events
- 5.1.3 Provide non-classroom opportunities for faculty-student interaction
- 5.1.4 Support the organization of student clubs, associations, and fraternal organizations on campus
- 5.1.5 Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula

5.2 Accessibility/Transportation

- 5.2.1 Ensure transportation link with local area metro system for increased access to campus
- 5.2.2 Offer classes in a variety of timeslots to permit flexible scheduling by students
- 5.2.3 Offer classes on weekends and special Friday-Saturday combinations
- 5.2.3 Offer classes in concurrent semesters to allow for student flexibility in scheduling
- 5.2.4 Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on - campus classes.

5.3 Housing

- 5.3.1 Encourage on-campus housing for students
- 5.3.2 Provide an appropriate number of housing slots to meet the needs of the student body
- 5.3.3 Ensure affordability of housing and meal plans
- 5.3.4 Develop housing patterns that may incorporate choice of major or other demographic issues

5.4 Counseling

- 5.4.1 Provide psychological and social counseling to students to support added stresses in society
- 5.4.2 Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions
- 5.4.3 Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs
- 5.4.4 Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal
- 5.4.5 Provide counseling services that are cognizant of the cultural and racial issues facing students

STUDENT SERVICES

Not Important Important

5.1 Campus Climate

5.1.1	Provide a safe campus environment for all students, faculty, staff, and visitors	All inhabitants of the campus must feel safe during their stay. Without such assurance, social and academic development are likely to be hindered.	1	2	3	4
Comments:						
5.1.2	Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events	The college experience represents more than the academic development of students. The institution must also consider and foster the social development of the student, and provide opportunities for this development.	1	2	3	4
Comments:						
5.1.3	Provide non-classroom opportunities for faculty-student interaction	Research has shown that faculty-student interaction is an important aspect of college life. Institutions should promote this concept and encourage faculty to become more involved in student life through administrative support.	1	2	3	4
Comments:						
5.1.4	Support the organization of student clubs, associations, and fraternal organizations on campus	Student organizations can positively enhance the college experience and indirectly and direclty promote the learning process.	1	2	3	4
Comments:						

	Component	Rationale	Not Important			Important
5.1.5	Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula	All activities on campus, academic and social, should promote cultural diversity to create a positive learning environment for students that respects the individual.	1	2	3	4
Comments:						
Additions:						
Additions:						

5.2 Accessibility/Transportation

5.2.1	Ensure transportation link with local area metro system for increased access to campus	Off-campus students must be provided with adequate transportation opportunities to encourage student persistence.	1	2	3	4
Comments:						
5.2.2	Offer classes in a variety of timeslots to permit flexible scheduling by students	The practice of standardizing the scheduling process at universities, barriers have been raised that dissuade students from attending certain classes. For example, a gatekeeper course offered only in the early morning session may not allow some students to attend because of the commute problems, scheduling conflicts, or work schedules.	1	2	3	4

	Component	Rationale	Not Important			Important
Comments:						
5.2.3	Offer classes on weekends and special Friday-Saturday combinations	Classes scheduled on weekends offer students another possibility to attend classes.	1	2	3	4
Comments:						
5.2.3	Offer classes in concurrent semesters to allow for student flexibility in scheduling	The practice of alternating some course offerings can create major scheduling problems for students including the extension of their college experience due to the unavailability of certain classes.	1	2	3	4
Comments:						
5.2.4	Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on -campus classes.	Distance-learning applications can allow students to attend class from either a satellite site or even from home, giving even more flexibility for students regarding scheduling and college attendance.	1	2	3	4
Comments:						
Additions:						
Additions:						

5.3 Housing

	Component	Rationale	Not Important			Important
5.3.1	Encourage on-campus housing for students	Students who live on campus tend to have higher persistence rates and are more involved in the social and academic environment.	1	2	3	4
Comments:						
5.3.2	Provide an appropriate number of housing slots to meet the needs of the student body	Institutions that cannot provide the necessary amount of student housing force students to live off campus, removing them from the campus experience.	1	2	3	4
Comments:						
5.3.3	Ensure affordability of housing and meal plans	Considering the difficulty students have in financing tuition, additional costs related to room and board must be controlled such that they do not dissuade college attendance.	1	2	3	4
Comments:						
5.3.4	Develop housing patterns that may incorporate choice of major or other demographic issues	Some colleges have found that creating housing sections based on academic discipline, social organization, or even race/ethnicity, have been correlated with student persistence and performance.	1	2	3	4
Comments:						
Additions:						

	Component	Rationale	Not Important			Important

Additions:

5.4 Counseling

	Component	Rationale	Not Important			Important
5.4.1	Provide psychological and social counseling to students to support added stresses in society	Today's college students face more uncertainties than previous generations and require a comprehensive social support systems to meet their needs.	1	2	3	4
Comments:						
5.4.2	Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions	The diverse social and psychological needs of students can be met through a variety of counseling services, offering support for students in a comfortable environment	1	2	3	4
Comments:						
5.4.3	Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs	Services offered at a college or university may be largely uneffective if they are not marketed properly to the student body. Counseling services, as with other student services, must be made known to students in a positive and supportive light.	1	2	3	4
Comments:						
5.4.4	Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal	The university should ensure that a student is enrolled in the appropriate program and classes to meet the career goals of that student. In addition, career counseling should also allow for the analysis of student aptitude and help students generate career goals.	1	2	3	4

	Component	Rationale	Not Important			Important
Comments:						
5.4.5	Provide counseling services that are cognizant of the cultural and racial issues facing students	Counseling services must be particularly attune to the cultural and racial issues that students must deal with on a daily basis, and provide support and assistance in dealing with those issues.	1	2	3	4
Comments:						
Additions:						
Additions:						

PART IV: Retention Program Development

Please comment on the following areas of program development

A comprehensive student retention program must:

	• be based on proven research	1	2	3	4
	• suit the particular needs of the campus	1	2	3	4
	• be institutionalized and become a regular part of campus service	1	2	3	4
	• involve all campus departments and all campus personnel	1	2	3	4
	• take into consideration the dynamics of the change process	1	2	3	4
	• provide extensive and appropriate retraining of staff	1	2	3	4
	• be student-centered	1	2	3	4
	• be cost effective, and not reliant on soft monies	1	2	3	4
	• be supported by a comprehensive student monitoring system that will become the foundation of all institutional research on campus and support every department	1	2	3	4
	• be sensitive to student needs and to diverse populations	1	2	3	4
	Others:				

		Not Important			Important

Stage 1 - Pre-Planning

	1. Analyze the size and scope of retention issue on campus	1	2	3	4
	2. Identify student needs on campus	1	2	3	4
	3. Assess the status and effectiveness of current retention strategies and programs on campus	1	2	3	4
	4. Identify institutional resources that may be utilized or redirected	1	2	3	4
	5. Identify successful retention strategies at other campuses	1	2	3	4
	Others:				

		Not Important			Important

Stage 2 - Planning

	1. The development of organizational strategies	1	2	3	4
	2. The identification of key stakeholders on/off campus and their roles within the retention process	1	2	3	4
	3. The refinement or enhancement of the college mission statement and goals	1	2	3	4
	4. The assessment, presentation, and discussion of Pre-Planning data	1	2	3	4
	5. The development of retention program components and operation strategies	1	2	3	4
	6. Development of implementation plan	1	2	3	4
	Others:				

Stage 3 - Implementation

	Others:	

		Not Important			Important

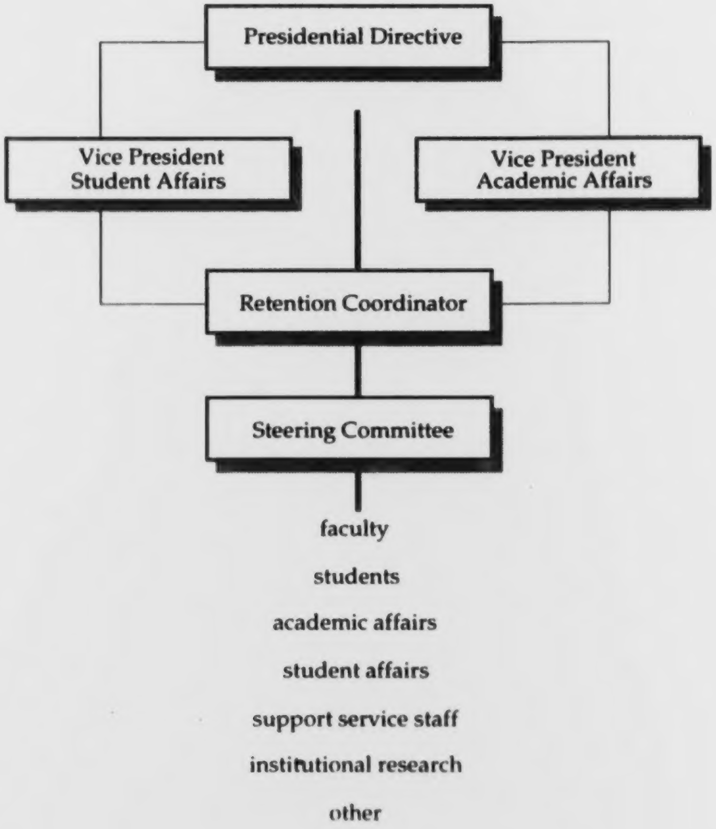
Stage 4 - Program Monitoring

The monitoring of the retention program is an essential practice that must be entrenched in the design of the system. Without the careful planning of an assessment strategy, the true value and effect of the program components can never be measured. The monitoring system should provide ongoing data to all campus personnel involved in the operation of the retention effort. The main practices that must be conducted include:

	1. Data collection and analysis of program components and student performance	1	2	3	4
	2. Dissemination of data to stakeholders	1	2	3	4
	3. Ensure that conclusions based on program monitoring are incorporated in program revisions	1	2	3	4
	Others:				

PART V: Organizational Strategy for Campus Personnel

Please comment on the following chart. Feel free to add diagrams or write notes related to the management design for a campus-wide student retention program.


Presidential Directive
Vice President Student Affairs
Vice President Academic Affairs
Retention Coordinator
Steering Committee
faculty
students
academic affairs
student affairs
support service staff
institutional research
other

APPENDIX D

FIRST-ROUND DATA

Total average for all variables was 3.6	AVG	1	2	3	4
1.1.1 Maximize availability of Grants and Scholarships compared with Student Loans.	3.7	0	1	2	10

A: Our college does not participate in student loans because 'minority' (Indian students) wind up in debt and as they often stop-out--this can be a major obstacle.

C: The overall effect of current over-dependence of the system on loans rather than grants/scholarships biases the production of baccalaureate and doctorates towards the loss of ability and high instability in persistence; and against all working class students (esp. students of color, women, and students with disabilities. Loan debt is a deterrent to the choice of graduate school. It biases the selection of majors and careers away from intrinsic interest (which strongly predicts persistence) toward materialistic selection (a poor predictor of persistence).

E: Sector of higher ed matters — as does class. More than race or ethnicity.

G: Inform students and parents of projected earnings of college grads vs. high school as a way of thinking about loan as an investment. Extend to masters and doctoral degree projections.

J: Ultimate logistical constraints and endowment lead to classist structure among colleges and universities.

L: NACME, Mortensen, ...

1.1.2 Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.	3.8	0	1	1	11

A: Meeting deadlines extremely important

B: At this point--families do not plan in advance--if they do, then elaborate retention efforts are not needed.

C: Caveat. Are there' sufficient' funds of these types available for students of above average ability? Do univ./college financial aid offices know what is available or communicate this to student s seeking that information. Students complain of ignorance and 'secrecy' among financial aid staff. Communication to students and families comes after attending to tacit rationing of this kind.

D: Responsibility of high school counselors

E: Important, but the key is interpreting the true value of a grant or scholarship, especially in face of competing offers.

G: Use computerized programs such as the College Board's Fund Finder to establish family financial need and availability of eligibility for scholarships, grants, loans, etc.

J: Especially critical for first generation college students and their families at LEP families.

L: Too early--not the U's responsibility

1.1.3 Frontload grants and scholarships to provide more support in the early years of college.	2.8	3	0	4	4

A: Students attending private colleges need money each year

B: Scholarships should have work/responsibilities attached other than a GPA maintenance.

C: Getting out is a major issue for undergrads at state institutions (ie. the less endowed). It is a serious problem for graduate students. Provision needs to be even for undergrads (ie. one 4/5 years). It is needed more towards the end for grads who get trapped into meaningless types of work while trying to complete dissertation work--esp. where TAs/RAs are cut off by depts.institutions after 3 o 4 years.
D: Tuition books and supplies cost more at the upper level
E: Yes, but sector of higher ed and class are issues.
H: Reduces the need for work--increased time on task at non vulnerable period in matriculation.
J: However, could use increased funding in later years as motivation.
L: No knowledge of this
M: Only because they become more efficient in obtaining funding from multiple sources

ADDITIONS
G: Timeliness is important for students getting info on and payment of loans or grants/scholarships.
K: There are still many race specific grant that are legal (federal, etc.); These should be mentioned also.

1.2.1 Inform students & family members of availability and responsibilities related to Loans. 3.2 2 0 4 6
C: Fear of loans is fear of future inability to repay them--ie., fear that jobs will not be available. Among women, fear of delays in child-bearing possibilities add to this.
D: Also related to the burden of a big debt after graduating
G: Inform students and parents of projected earnings of college grads vs. high school as a way of thinking about loan as an investment. Extend to masters and doctoral degree projections.
J: Especially critical for first generation college students and their families at LEP families.
M: They simply may not have knowledge

1.2.2 Streamline bureaucracy & forms to simplify the application process. 3.1 2 1 3 6
E: Actually great progress has been made in this front within boundaries of ...
F:
G: Offer workshops for parents and students where these forms can be filled out. Use computer applications such as the College Board EXPAN fundfinder.
J: Especially critical for first generation college students and their families at LEP families.

1.2.3 Frontload loan payments to provide more support in the early years of college. 2.2 5 0 3 2
A: Students attending private colleges need money each year
B: Loans are not good for students
C: As 1.1.3--the package needs to be made even for undergrads and loaded towards finishing the dissertation (when it is almost impossible to work for money for grad students.

G: Try to make it possible for students to devote full time to study and adaptation to college life without need to work during freshman year.
H: Effort should be made to minimize loans at Freshman, sophomore years--Loans are more palatable when the goal of graduating is clearly in sight.
K: Don't understand. Loans should not be repaid until after college.

ADDITIONS
L: Minority and low income families have little experience with loans and so are reluctant to undertake them.

1.3.1 Increase availability of assistantships and work study programs for undergraduate and graduate students. 3.9 0 0 1 12
C: For grads--less teaching and more research-related opportunities. For u/grads, relevant, hands-on experience and contract with the chosen field(s). Renumeration needs to be related to actual living/educational costs--otherwise students 'top up' built less relevant work and waste of their time.
E: As are internships and certain campus leadership opportunities.
G: A big part of the reason for this phenomena is that students become aware of opportunities and come to understand the system and what it takes to succeed. Also, get more mentoring.
J: Are the studies you mention able to delineate between generalized support and support that is part of an institutionalized or department effort to create learning communities.

1.3.2 Increase faculty participation with regard to student assistantships. 3.8 0 1 0 12
C: Inc. faculty participation in any forms--esp. pedagogical and in advisory/counseling roles. Apprenticeship contacts (optimal) will be a luxury in large institutions.
D: More important at the graduate level than undergraduate
L: Must be part of the institutional reward system

1.3.3 Attempt to design assistantships and work study programs on or close to campus. 2.8 1 4 3 4
C: The main issue is relevance, not distance.
D: The better or most appropriate opportunities may not be close by. The experience is more important than distance.
H: Not necessarily so--Juniors and Seniors already committed to major not affected--$$ to complete financial package for graduation takes precedent.
I: This not always true. Students involved in national service and international studies gain a great deal from their experiences.
J: Astin and others have repeatedly found evidence for importance of involvement in campus 'life.'
L: Look at co-op/internship literature

1.3.4 Develop partnerships with local area business to forge work and research opportunities for students. 3.1 0 3 5 4

C: More applicable in some major than others--very important in engineering.
D: To the extent possible according to opportunities available in the community. Some communities are limited.
G: Off campus? This could be valuable and is an exception to 1.3.3.
J: Interesting, but spatial heterogeneity of 'appropriate' businesses makes this approach problematic.
L: Look at co-op/internship literature

1.3.5 Keep assistantships and work studies under 25 hours per week for full-time students. 3.8 0 1 1 10

A: Ten to twenty
C: Fine--but has to be tied to renumeration that is realistic--otherwise students will have to supplement their work study/assistantship wages (with an increased number of hours).
E: The number of hours of work will differ by institutional type. 15 hrs./wk at a research university is suicidal
G: I would agree with a 20 hour maximum rather than 25.
J: Although many poor students (especially those with children) can't survive on less than 30-35 hours at low wages.

ADDITIONS
E: The main issue is the complexity of interactions with the campus and with the student's intellectual or professional chosen domain.
J: 1.3.6 Assistantships from towns or metropolitan areas (or businesses) that provide a mechanism for work after graduation at loan forgiveness

1.4.1 Inform students and families of all available options related to the financing of college. 3.9 0 0 1 10

B: Same comment--minorities typically do not plan 4-6 years ahead for education.
C: This should not even be an issue. Why is this not done? Is covert rationing of inadequate resources the cause?
G: Inform students and parents of projected earnings of college grads vs. high school as a way of thinking about loan as an investment. Extend to masters and doctoral degree projections. Use computerized programs such as the College Board's Fund Finder to establish family financial need and availability of eligibility for scholarships, grants, loans, etc.
I: Very important, especially for first generation students.
L: Too early

1.4.2 Provide money management training to students and families. 2.9 0 5 3 4

C: Less important than providing a means to a living wage in a relevant work context. We are all 'bad managers.' Bad choices become ..., however, when funds are insufficient to meet need.
E: Easier said than done.
J: Good idea, but staff time probably could preferably be spent in more cost-effective ways.
L: Students only once matriculating; not the role of the university

1.4.3 Monitor student money usage during college. 2.4 1 5 3 1
A: Most of the money is spent on tuition and room and board. There is very little to monitor. It might be a good idea to take a look at withdrawal policies (for a year and then return).
B: Is it legal?
C: Blaming the victim!
D: Threatening and an invasion of privacy if specifically focused on the financial aid money.
E: Again, this depends on institutional culture--it could easily be constructed as an invasion of privacy
G: How would this be done?
I: This is intrusive
J: Again, staff time and logistics of monitoring system are critical constraints.
L: Is this not a privacy problem?

1.4.4 Train financial counselors to be sensitive to issues related to race and ethnicity. 3.3 1 2 2 7
C: This is a class-sensitive rather than race-sensitive issue. A red herring. Need is need is need.
D: Sounds good but really not sure what this means.
E: This is too general to be useful.
I: Very important.
L: Racist phrasing. Awareness of racial/ethnic issues should be institution-wide.
M: Essential

ADDITIONS
C: Overall, a coherent national system of financial support --especially for students of high and above-average ability, is the issue. Selective programs (eg. for min. students) foster racial tension on campuses. We are fostering a mediocrity based on accumulative advantage.
G: Availability of emergency loans is crucial.

2.1.1 Work with pre-college programs to identify potential recruits. 3.8 0 0 2 10
D: The earlier you start this initiative the better
E: I've seen hundreds in my career. They vary in quality. Some are counterproductive. Impossible to score.

G: Best source for motivated, well developed students. Active participation by the college/university early helps to open the pipeline of students with preparation and interest to pursue and succeed at the college level, particularly in math and science-based fields.
J: e.g., HSF Young Scholars, Dept. of Educ. xxx xx, NIH-MBRS, and many more.
L: SECME, NESA, PRIME, etc.

2.1.2 Attempt to match student academic and career goals with the institutional mission of the campus. 3.5 0 1 4 7
C: (NOTE: Define: institutional mission--job availability?). Students report they get little/no overall career planning counseling. Their choices have little to do with any advice on information offered on campus--and are offer poorly founded. Faculty do little to help in this matter and seem poorly informed about career possibilities--esp. mathematics faculty.
D: Do not wait until the student is recruited to determine if goals and mission are in harmony (student vs. institutional).
E: Absolutely!!
F: Students may be undecided about academic and career goals or require some type of developmental program about goal-setting in order to make informed choices.
G: Stated mission vs. actually priorities, practices and atmosphere can be very different.
I: What about students attending 2-year colleges with diverse missions? What about students who get tracked into non-academic programs despite the fact they want a college degree?
J: Except that many public institutions have either a vague mission or a generalized regional service mission and nearly open enrollment.
K: Very important
L: Nora, Cabrera

2.1.3 Monitor the participation of students enrolled in pre-college programs. 3.8 0 0 2 10
C: The quality of pre-college preparation is)nationally, and within regions) so variable. It's hard for students and their parents accurately estimate its value/quality. This would seem a greater priority than academic selective programs for a relatively few students.
E: But campuses will and should have a cluster of programs of varying intensity--not all need tight monitoring.
G: Active on-going articulation with the local school system about the expectations for student preparation and how these can be achieved.
J: Except that many public institutions have either a vague mission or a generalized regional service mission and nearly open enrollment.
L: Not the University role

2.1.4 Develop and focus outreach programs on the prime-targeted population of the university. 2.8 2 2 2 4

C: As 2.1.3. Raising the standard of science, math, English etc. preparation and monitoring its quality are priorities--more important than picking out and supporting a few.
D: The 'main' population possibly does not need recruitment; the under-represented population needs recruitment.
G: At the pre-college level outreach for minority students should be broad. Also, different populations require different outreach strategies.
I: Not so sure on this one.
J: Constraints: logistical and conceptual--staff, facilities, timing, but also definition of mission.
K: Should focus on populations underrepresented at college.
L: Closes options for the not prime-targeted population
M: Not clear what you mean by 'target population?' Could this not exclude 'at-risk' populations?

ADDITIONS
C: The approach is too timid. It reinforces a poorly performing status quo. Tinkering with this system won't produce the defined result of a better educated work force in which merit is coherently recruited and supported (or a national resource).
D: Use of alumni network for recruitment
E: Many precollege programs have anti-acculturative effects. It is critical that precollege programs are congruent with the institution's mission.
G: Use work study students and students preparing to become teachers to make visitations to middle and high schools to inform/underscore students of courses needed for good academic preparation, also about study skills, reading, availability and advantage of taking advance courses such as AP.

2.2.1 Incorporate portfolios, interviews, and other non-cognitive assessments. 3.4 1 1 2 8
B: Or use a sliding scale for scores--typically most minority students score lower to indicate some potential
D: SAT is not the best predictor of success. It is a reflection of past experience. High school GPA is the best predictor of success.
E: Depends on institutional type
G: Through institutional research find what best predictors of success are for the given college--what is the predictive validity of the standardized tests?
M: SATs are not the best predictors of 'success.'

2.2.2 Reduce the weight of SAT, ACT, and other tests. 3.3 1 1 4 7
B: Portfolios not quite as important as personal assessments by people who know the students.
C: The quality of the HS and earlier teaching matters more than how its tested for. Attend to this first.
E: Many institutions have gotten the balance down!

G: Emphasize the high correlation between SAT/ACT and the courses taken. Offer workshops.

2.3.1 Provide early orientation activities for families. 3.7 0 1 2 10

A: Very important. Reduces anxiety of parents as well as students
B: Often family participation is impossible or quite difficult.
D: Very good but practical only for those familiar within the vicinity. The distance for many families would be prohibitive.
G: This is particularly important for students from families where they will be the first to attend college.
J: Constraints: logistical and conceptual--staff, facilities, timing, but also definition of mission.
L: Not too early

2.3.2 Provide opportunities for pre-college students to live on campus. 3.8 0 0 3 10

C: Works well--develops bonding and a sense of belonging
G: Summer bridge programs have been very effective.
J: e.g., HSF Young Scholars, Dept. of Educ. xxx xx, NIH-MBRS, and many more.; Constraints: logistical and conceptual--staff, facilities, timing, but also definition of mission.
L: Summer bridge program

2.3.3 Provide satellite orientations for non-local students. 3.5 0 1 3 7

C: Not sure how 'do-able.'
G: Technology considerations?
J: Constraints: logistical and conceptual--staff, facilities, timing, but also definition of mission.
L: Students should be on-campus

2.3.4 Involve all campus departments in the orientation process. 3.7 0 1 2 10

F: Does this mean all academic departments? Such a process may cause information overload.
J: COMMON IN MOST LIBERAL ARTS COLLEGES AND HBCU/MIs

2.3.5 Ensure personal communications with students and families via phone and visitations. 3.4 0 1 5 6

D: Visitations may not be practical for those located far distances from campus. Perhaps could be done by alumni.
E: You've listed a small number of important strategies--far from comprehensive.
G: Personal contact is absolutely essential!
J: Constraints: logistical and conceptual--staff, facilities, timing, but also definition of mission.
L: Time-frame?

ADDITIONS

D: Freshman orientation should be a minimum of one term and preferably one year. Should be required and for credit.

3.1.1 Provide academic advising and counseling for students on regular basis. 3.8 0 0 2 11

A: Attitude of student comes into play. Student may not see appointments as important.
C: A pro-active system required to schedule meetings and catch problems before they develop. Most student crises follow predictable patterns and can be planned for. Students need to know where problems are 'normal' and need help in how to address them.
E: The issue is the substance and organization of the advising. Does the advice have an evidentiary basis?
G: ESSENTIAL EARLY ON AND CONTINUING. A MENTOR SHOULD ALSO BE ASSIGNED.
J: Interesting contrasts: Good liberal arts colleges at HBCU/MI at Tribal Colleges vs larger universities, especially PWIs.

3.1.2 Keep log of student/faculty-staff interactions in a computerized monitoring system. 3.1 2 2 1 7

B: This becomes paperwork for paperwork
C: OK--but faculty commitment is the key.
E: You're kidding--very expensive and would hinder spontaneity--I see 30 students informally a week.
F: What about the important informal student/faculty/staff interactions or interactions that are the result of co-curricular activities?
G: What does this mean?
I: Very time consuming. Not sure this will have impact. It's the quality not quantity of interaction that count.
J: Interesting idea--faculty will worry about accountability, access to records, academic freedom

3.1.3 Use faculty for the academic advising students when possible. 3.8 0 1 1 10

A: Faculty must be trained
B: GOOD. Faculty advisors--some of us are not effective in this role.
C: All contacts between faculty and students are important and are to be encouraged.
D: Provide faculty incentives. Should be part of contract and count toward tenure, promotion, and salary.
E: A team approach--what is properly faculty role; what is properly administration's role.
G: remove 'the' and add advising 'of' students...
J: Key--use people committed to students who also know academic infrastructure.
K: Very important.
L: Pearson, Velez

3.1.4 Provide appropriate training in academic advising for faculty. 3.8 0 0 2 11

C: A difficult issue to address. Students report that faculty do not know the answers--and may give wrong info, with unhappy consequences (esp. re: degree requirements). Lack of knowledge about career possibilities is a serious problem. Finding ways to address this will take help from career specialists working with departments.
D: Very important
E: See above.
G: Faculty office hours should also be extensive so they are accessible to students. Best must also reach out to students.
J: Key--use people committed to students who also know academic infrastructure.; also, this would need to be coupled to criteria for promotion and tenure.

ADDITIONS
D: Faculty behavior--non verbal communications, very important
E: This section is hopelessly shallow. The hard issue is the management and interaction of the different messages students receive.

3.2.1 Incorporate a variety of instructional methods to support student learning. 3.9 0 0 1 9
B: If it is not just more unrelated work--if all classes are huge lecture what good does multitude of styles do?
C: Offer faculty practical guidance about instructional options/strategies, and information about the learning theories on which they are based.
E: For each barrier courses the obstacles--organizational and cognitive--differ--learning styles (not taken seriously by most contemporary psychologists is but one narrow issue. Most faculty in large institutions don't even know their student's names let alone their learning styles. Hopelessly simplistic.
G: In-service for faculty to develop the capacity to teach different strategies is necessary or else it will not happen.
I: Very important
J: But this should not be 'supplementary.'
L: Extremely difficult

3.2.2 Offer supplementary courses that focus on academic support skills (e.g., study skills, note taking, listening, writing, reading, time management) and academic content (e.g., biology, calculus, etc.). 3.7 0 0 3 8
C: Students find these very valuable/ They report regret in not 'discovering' these services sooner. Promote and re-promote them.
D: I disagree with this concept that there is a deficiency in 'ability.' NO! The ability is there! It is the 'experiences.'
E: The organization of these supplemental courses and their placement in the institution is key.

G: This should be required for all of this students
J: Common in many HBCU institutions and it works well. Constraints: Personnel (well-trained), facilities, institutional mission.

3.2.3 Utilize peers as instructional personnel for supplementary instruction when possible to assist students. 3.8 0 1 1 10
A: Very important!
B: Pick peers and orient peers carefully.
C: Yes--and pay them decently!
G: There should also be study groups led by faculty and trained graduate students.
J: But--training, understanding of academic infrastructure, connection to faculty.
K: 3.2.1 vague idea of how will be incorporated in academic program.
M: I assume refer to study groups, etc., e.g., Uri Treisman's research at California

3.2.4 Encourage the use of peer study groups to foster learning and incorporate more labs with classwork. 3.9 0 0 1 12
A: This should be done even if students do not choose to do so.
C: Yes--but there are special problems for some minority groups re peer groups. (eg., how do you accommodate isolated black or disabled students. We don't know enough about the conditions under which peer student does and does not work well (eg. S&H's 1994 study indicates that same-minority-group peers support failure/underachievement among black males; and reject poorly-achieving members among some Asian groups). We cannot always assume that all peer study in all circumstances is 'good.' More research on the dynamics is needed.
D: Collaborative learning is highly recommended.
G: Development of a supportive peer group in structure and study groups as well as in informal activities, including social, is important.
I: Very important.
J: See work of Slavin on structure of collaborative learning.
L: Treisman

3.2.5 Monitor all supplementary instruction activities by students and log into the computerized database. 3.2 1 1 3 5
C: Not sure what you mean here.
E: Have you thought through the cultural implications of this? Let alone econom ...
G: And to catch students who are not doing well before they slip through the cracks.
J: Interesting, perhaps core of GIS model as monitoring system.
L: Can monitor, but not necessarily assess
M: Not sure what this means? i.e., monitor computer use?

ADDITIONS

E: Vary one's approach to teaching, use many appropriate pedagogical techniques--yes--learning styles, no real research evidence that's convinced me.

F: Early assessment of students learning styles.

3.3.1 Provide regularly scheduled and easy access tutoring for students with regard to course work. 3.9 0 0 1 11

B: Tutoring needs to be directly related to courses.

C: (A) Needs to be within the major (central systems work less well; (b) How funded? Many students have to pay for this at present.

D: Usually the problem is not accessibility; it is that the students will not attend sessions.

E: Again, the way academic support is linked to the course--how' it's thought of by students--e.g. remedial vs. immersive vs. ESP matters.

G: There should be an expectation that all students are to attend, depending on course grades.

L: AWIS

3.3.2 Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors. 3.8 0 0 3 10

C: Fine--but pay them.

E: Sure

G: Use as many same ethnic group students as possible for tutoring.

J: Constraints: TA/RA use is constrained by fiscal and course needs in many departments.

3.3.3 Encourage peer tutoring and group studying within class population. 3.7 0 0 4 8

C: How to be identified and recruited? Will they want to spend time doing this? A paid job?

E: Yeah, but peer groups can be created in many ways--some quite destructive.

G: Study groups from the same class, yes.

J: But who does the 'encouraging' and who provides the models for students. Some students come from groups that hurt them--group think, reinforcing misconception.

L: Can polarize

3.3.4 Encourage faculty to support the academic needs of students outside of class time. 3.8 0 0 3 10

B: In small groups

C: Any form of departmental bonding (across years) seems to be unproductive--to the price of a little catering.

L: Important, but a heavy burden as faculty

M: Hard to do!

3.3.5 Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students. 3.5 0 2 3 8

C: OK-but being called upon to fill this role is already reported to be a burden to faculty and more serious students of color. Do all role models/mentors have to share the gender or ethnicity of targeted groups? (eg--strong evidence that some women faculty regrets the approach of younger women looking for help--see Henry Escowitz' work on 'critical mass.'

E: Scott, this is like learning about human sexuality by reading a book on vertebrate physiology--it's far too general to inform good practice.

G: Essential

H: Useful but not absolutely necessary--knowledge of subject matter and sensitivity to students equally important.

J: But, remember that minority and women faculty generally assume more than their fair share of this kind of work, often without positive effect on their promotion and tenure.

ADDITIONS

D: Tutoring and mentoring are distinctly different and should not be combined

F: When possible residence halls should be involved in programming SI activities.

M: Address rewards/rewards for faculty who monitor

3.4.1 Support faculty to work with students on research projects. 3.8 0 0 2 11

C: And for all other efforts to change pedagogy, student assessment practices etc-- better retention.

3.4.2 Integrate regular research activities into curricula. 5.9 0 1 2 9

C: Yes--Project Kaleidoscope's national initiative (Independent College Office).

G: It certainly will get students thinking about research as a viable career path.

3.4.3 Develop industry partners for research opportunities. 3.5 0 1 4 8

C: Hands on experience and networking within work organizations prior to graduation is an important avenue to early relevant employment.

G: Application of math and science to real world needs and problems increases interest.

J: Interesting, but spatial heterogeneity of 'appropriate' businesses makes this approach problematic.

3.4.4 Encourage business and industry to participate on campus through in-class demonstrations and experiments. 3.3 1 0 6 6

C: Use the student organizations for this--women's orgs (SWE etc) and some ethnicity organs (eg. for black or Hispanic engineers) already do this well.

J: Interesting, but spatial heterogeneity of 'appropriate' businesses makes this approach problematic.

3.5.1 Develop pre-college programs at the elementary and secondary education levels. 3.7 0 0 4 8

E: It's the character of these programs that matters---there are many expensive counterproductive ones.
G: Important!!! Students should be made aware of what courses they need to take for optimal preparation to keep all options open.
J: However, we would need to restructure most colleges and universities, and also the mind-set of faculty, to develop K-16 education.
L: MESA, SECME, PRIME
M: You can not start too soon.

3.5.2 Offer pre-college programs on and off-campus. 3.5 0 1 4 8

J: Most of those exist on self-money. How do you restructure budgeting in austere times?
K: Precollege programs should be on campus.

3.5.3 Monitor student progress in pre-college programs. 3.6 0 0 5 7
E: Sure, but again institutional and program diversity matter.
G: Multiyear on-going involvement is needed.
J: The monitoring models don't exist yet.

ADDITIONS
M: Again, clarify 'monitor' in this case--e.g., survey instruments. (What types), observations, etc.

3.6.1 Provide summer academic and social support for admitted students before the commencement of the freshman year. 3.9 0 0 1 11
C: Evidence suggests these work well
E: Not necessarily--the research is mixed--you need to isolate characteristics of effective programs.
G: Orientation to services, expectations, etc.
J: Review NSF, NIH, D of Energy, and DOE SSTP programs.
K: Very important.
L: NACME, Wilson, Clewell

3.6.2 Provide on-campus residency for students during bridging programs. 3.9 0 0 1 12
G: A peer group should be developed for essential support that first year.
J: Review NSF, NIH, D of Energy, and DOE SSTP programs.

3.6.3 Monitor all student progress in bridging programs. 3.5 1 0 3 8

E: There is remarkably little history in higher ed of evidence-based decision making. How do we create a culture that seeks data for pedagogical and curricular decision making? Collecting data without it is an expensive waste.
G: Diagnostic testing and supports set up based on resulting information.
I: Need specifics on everything selected to monitoring. What are the key variables that need to be monitored?
J: Sure, but how? Let me add here that few people really know the kinds of assessment instruments and computer databases available.
M: 'Monitor?'

ADDITIONS
D: There should be a distinction between outreach programs and bridge programs.

4.1.1 Develop an ongoing review process of curricula utilizing faculty input and outside consultation.	3.9	0	0	1	12

G: Core competencies to be developed in first two years by all students (eg. NTE general knowledge section). Identify where in the curriculum each competency will be taught. Writing in every class - across the curriculum. Faculty support needed -- on-going professional development, attending professional meetings, etc.
J: Couple to research in teaching and learning
L: See Drexel University

4.1.2 Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students.	3.5	0	1	4	7

B: This can be over-emphasized. Students need foundations and then relevance
D: This component is compounded with two factors, each of which I'd respond to differently. I cannot give one composite answer. A(college curricula and instruction) = not in agreement (1); B (students visualize impact and relevance of theory) =very important (4)
E: This has been overplayed--students need balance!
G: Faculty support and professional development needed. Set up interdisciplinary center.
J: Constraint: Limited experience of faculty

4.1.3 Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction.	3.4	0	1	5	6

A: Important but not a key factor in persistence issues
C: (a) more stuff taught is counterproductive. A 'leaner' curriculum more carefully though out may be better.
(b) More teacher-learner contact is critical. Computer-aided instructional techniques need to be fitted into a more personal pedagogy. (see attached article).
D: You do not increase quality; it is improved. Let us not imply that this is 'the answer' to it all.

E: It also can have unintended effects on access.
F: Provide training for faculty on integrating technology in instruction.
G: Faculty support needed to ensure the incorporation of relevant educational technology.
J: Couple to research in teaching and learning; Constraint: Limited experience of faculty

ADDITIONS
C: 'Dullness' of material taught, and poor organization of materials presented in lectures are serious, common problems. Dullness 'turns off' bright students.
G: Internet, telecommunications, etc. Use of multiple databases and access to others addressing same issues around the world.

4.2.1 Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students. 3.7 0 0 4 9
B: What university can afford to do this
C: A balance of methods seems optimal. The main thing is to persuade faculty to try them, and to provide them with practical strategies--they don't know where to begin. Who will teach the teachers?
D: EDIT: exporatory=exploratory; create=creative
E: Balance helps.
G: Connect with K-12 reform, discipline-based standards (e.g., problem-solving approaches in NCTM standards).
J: But, review complex and diverse literature and collaborative learning, constructivism and its critique, multicultural, bilingual education.

4.2.2 Provide homework, out-of-class assignments, and in-class assignments for students. 3.4 1 0 4 7
C: A balance of methods seems optimal. The main thing is to persuade faculty to try them, and to provide them with practical strategies--they don't know where to begin. Who will teach the teachers?
D: This sounds peculiar in that K-12 education source of training is the colleges. Again two factors to which I have different responses--but I gave a composite response.
G: Certainly out of classroom explorations and activities are needed.
J: The difficulty is creating a 'multi-directional' learning experience while maintaining coherence, depth, and breadth in curricula.

4.2.3 Utilize educational technologies to complement instruction. 3.4 0 0 7 5
C: Self-paced learning and self-testing seem to work well for particular types of material.
E: 'Can' is the key word
F: Provide on-going training and development activities.

G: Internet, etc. Faculty support needed to ensure the incorporation of relevant educational technology.
J: Couple to research and teaching and learning. How do we know what works?

4.2.4 Provide appropriate instructional training for teaching faculty. 3.8 0 0 2 9
C: As 4.2.1 Teaching faculty and TAs/ how to teach is an urgent matter. However, their willingness to accept the need to learn is even more urgent. Their attitudes towards education departments and the knowledge they could offer is generally very negative--but this is an important resource.
E: 'Training suggests your bias and outsider status. The work is an .... to faculty. You need to build a model that builds on the strengths of faculty and respects the way they learn.
G: If this doesn't happen nothing will change, nothing new will be initiated or sustained.
H: Should apply to research faculty as well.
J: Although academic freedom issues again become problematic; couple to criteria for promotion and tenure.
K: Most important!

ADDITIONS
F: Items 4.2.3. and 4.2.4 should comprise a separate entity as in Item 4.4. This is an important component of a comprehensive plan of action. Strategies under 4.4. Faculty Development/resources should include centers for teaching excellence, grants for classroom research and an appropriate faculty reward system.
G: Lecture, coaching, facilitating, groups--selling the environment.

4.3.1 Conduct extensive student testing and assessment on a regular basis to monitor student progress. 3.8 0 0 3 9
A: This practice would be of great value. However, the lack of this practice is not an accident. Many faculty feel that t is important for the students to ...
C: It's not the regularity of assessments that's the issue. It's the fit between learning objectives and assessments used that's critical. These tend to be tacit rather than overt at the present.
I: Need specifics
J: But--faculty are weak in areas of research and authentic assessment.

4.3.2 Develop assessment instruments that ask students to synthesize and transpose information to new situations. 3.8 0 0 2 10
C: More is needed--testing of conceptual group and development is the most fundamental testing issue--then follows a whole taxonomy of intellectual skills and understanding--you only have one small piece of it here.

E: Sure, but how about analyze? How about imagine? How about challenge? Why just synthesize and transpose?
G: Not just assessment installments, but also daily assignments, Diagnostic.
I: See Baxter Magolda, 1992. Knowing and Reasoning in College. Jossey-Bass.
J: But--see 4.3.1 (But--faculty are weak in areas of research and authentic assessment.), and review work on current ideas and instruments for authentic assessment.

4.3.3 Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.).	3.7	0	0	4	8

D: Very, very good
E: This should not be mostly about preferences--a weak reason for modern assessment.
G: Project strategies. Include frequent written and oral communication opportunities in all courses.
M: This helps to define 'monitor'; more is needed.

4.3.4 Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment.	3.2	2	0	5	6

C: Unless we get the nature of student assessments addressed, there is no point recording the outcome.
E: Your must be kidding. How about starting with something for more modest and personal. Not that JW Carmichael, Mike Freeman, etc, and I don't do this. If research supports this, I'd like to see its methodology.
G: Develop and use relational database, on-going monitoring.

ADDITIONS

C: I feel these four items are off-center--so I have not given them a rating. The priorities would seem to be (a) persuading faculty that weeding out is not the main objective of student testing methods in the earlier years. (b) giving faculty access to learning theory, and practical options for student testing (eg. developing contacts with education faculty skilled in the teaching of science and mathematics). (c) encouraging faculty to see pedagogical reform as a professional priority, and supporting their attempts to change. (incl. addressing renumeration, tenure, promotion and other rewards-for-change issues).

5.1.1 Provide a safe campus environment for all students, faculty, staff, and visitors.	3.8	0	0	2	11

D: The environment must be free of racial/ethnic discrimination
G: Racial-hostility, epithets, etc. Do not make for an environment that feels safe.

5.1.2 Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events.	3.8	0	0	3	9

C: Departmental initiatives matter more than institution-wide activities. Bonding to the majors is what matters.
G: A feeling of belonging and social acceptance in a peer group is essential.
J: Key--integrating students who live off-campus and integrating non-traditional students

5.1.3 Provide non-classroom opportunities for faculty-student interaction. 3.8 0 1 0 11
C: As 5.1.2. 'Institutions' should be 'departments.'
J: But--student service is usually disarticulated from academic affairs. Education?
K: Very important
M: Need to clarify

5.1.4 Support the organization of student clubs, associations, and fraternal organizations on campus. 3.3 0 2 4 6
B: Ones that integrate not segregate
C: Student societies related to their major are shown to be a valuable career-bonding and networking mechanism. For minority students and students with disabilities campus-wide student organizations are more important (because of a small number).
G: However, some fraternal organization experiences can be distracting and detrimental to focus on academics (e.g., Some students grades suffer greatly when during the semester when they 'pledge' a sorority or fraternity.
J: Depends on relation of 'clubs' to institutional mission and integration of students into campus life.

5.1.5 Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula. 3.9 0 0 1 12
B: Care to have multiculturalism be real rather than let's have a pow-pow for the Indians. Participation must be multicultural.
C: Be careful, however. The standard experience suggest backlash when 'diversity' is oversold. Not tolerating certain types of behavior does, however, matter.
E: How it's done is what matters. Almost all campuses say they do the above, yet many a chilly environment exists?
G: Crucial-evidence of diversity being valued must be evident throughout the curriculum.
K: Provide multicultural training for campus security staff.
L: NACME, Pearson, Wilson, Clewell, Tinto, etc.

5.2.1 Ensure transportation link with local area metro system for increased access to campus. 3.7 0 0 4 8
C: This is particularly important for commuter campuses (eg. Minnesota) and all disabled students. (**I have found serious mis-fit between bus services and class/ lab TIMES IN MY RECENT U OF MINN STUDY OF DISABLED STUDENTS.
J: Key--integration of all students into community of learners.

5.2.2 Offer classes in a variety of timeslots to permit flexible scheduling by students. *J:* Good idea--we have run into problems, mostly logistical.	3.8	0	0	2	10
5.2.3 Offer classes on weekends and special Friday-Saturday combinations. *C:* Important to mature students, single parents, and working (part-time) students. *E:* Depends on Institutional type *J:* Requires rethinking of faculty commitments to personal and material life.	3.5	0	2	2	8
5.2.3 Offer classes in concurrent semesters to allow for student flexibility in scheduling. *C:* A very serious problem -- added to by erroneous faculty advice *E:* Depends on Institutional type *J:* Not necessary if advising is good. Besides, as a Char, I only have so many faculty. So many rooms for lecture or labs.	3.6	0	1	3	8
5.2.4 Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on -campus classes. *B:* Distance learning is not good for academically challenged students they thrive on personalized contact. Good for advanced and ... *C:* Very important for disabled students--however there is strong faculty resistance to students' not being present in the classroom--will need promotion (education.) E-mail is a very important link with faculty, and has been well-developed on some campuses--eg., Case Western. *E:* Depends on Institutional type *J:* Need more work on effectiveness and instructional strategies and faculty professional development.	3.3	0	2	5	5
5.3.1 Encourage on-campus housing for students. *A:* I am not to certain about your rationale *C:* Caveat--the student population is aging--the generic financial problem--delayed higher education starts--more students with established families (inc. children). *F:* Schedule academic support services in housing units. *H:* Critical during the freshman/sophomore years. *I:* What about 2-year colleges? *J:* See recent Astin work, also others who worked on environment and campus climates: Boyer, 1987, Fleming, 1984; Nettles, 1988; Morris et al, 1989.	3.6	0	1	3	9
5.3.2 Provide an appropriate number of housing slots to meet the needs of the student body. *C:* More family housing needed for grad students.	3.5	0	1	5	7

J: See recent Astin work, also others who worked on environment and campus climates: Boyer, 1987, Fleming, 1984; Nettles, 1988; Morris et al, 1989.					
5.3.3 Ensure affordability of housing and meal plans. *B:* Most minorities targeted receive full assistance anyway	3.7	0	0	4	9
5.3.4 Develop housing patterns that may incorporate choice of major or other demographic issues. *B:* This category needs to be broken-down. Academic discipline in 3-4 years or grad; not by race, not by social organization. *D:* This is 'tracking' and is not good. *E:* Much too complicated for a Likert scale--check all recent papers of Claude Steele at Stanford for the subtleties, especially work on stereotype vulnerability. *J:* Although I have encountered increasing resistance to this under the guise it promotes segregation; this concern generally raised by non-minorities.	3.1	2	0	5	5
ADDITIONS *C:* All of the above matter. Disciplinary and minority group housing has been shown to work well--it allows some support services (eg., tutoring and organized group study) to be cost-effectively run).					
5.4.1 Provide psychological and social counseling to students to support added stresses in society. *C:* How counseling/advising/career planning are to be coordinated is a major issue. Students would like a one-stop service. *D:* Not just added stresses--but include new roles and responsibilities	3.8	0	0	3	10
5.4.2 Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions. *C:* over variety is a problem. Students complain they can't find which resource to go to for what purpose.	3.3	1	1	3	7
5.4.3 Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs. *A:* Very important *C:* A handbook of services is needed. Disabled students in my current study are asking very strongly for this.	3.4	1	1	3	8
5.4.4 Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal.	3.8	0	0	3	10

C: Career counseling is far too late in the student's experience at present. Reliable service needed to allow students to think through their options with knowledgeable and up-to-date counselors.
G: Strong role for advisor and mentor.
K: Very important.
M: Career counseling has not been very effective in pre and post college institutions?

5.4.5 Provide counseling services that are cognizant of the cultural and racial issues facing students.	3.8	0	0	3	10

C: May be one of the most important functions of minority program officers. (along with financial advice).
E: Again, all
G: Absolutely essential!!!
I: Very important.

ADDITIONS
M: This is important but poorly done

APPENDIX E

SECOND-ROUND INSTRUMENT

Instructions

The first round of this study, albeit long, was an important step in developing a foundation for the remainder of this research project. The purpose of this second (and final) round is to give the respondents a chance to review some of the data from the first round. Be assured that your task for Round Two is fairly straightforward and should take you a *fraction* of the time required for Round One.

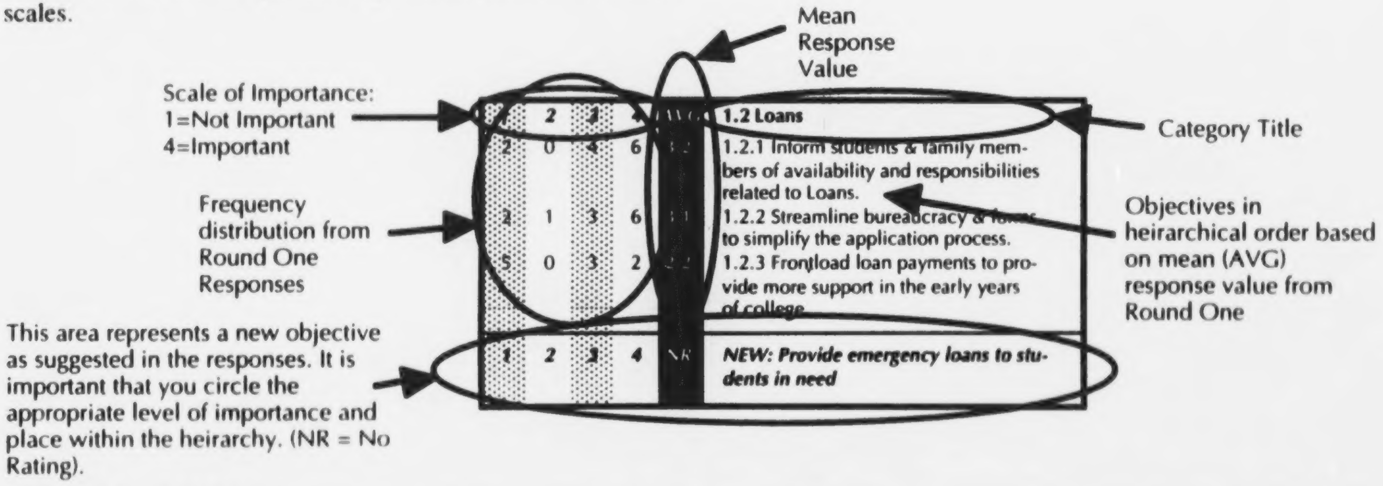
Following this page you will find five pages, one for each classification of the framework (e.g., Financial Aid). Each classification is divided into separate catagories (e.g., Loans), such as was done in Round One. The figure below is an example of the layout for each category. The first four columns on the left illustrate the frequency distribution for each objective within a category. For example, in 1.2.1 below, two persons selected "1" (Not imporant), no one selected "2", four persons selected "3", and six persons selected "4" (Most Important). The average or mean response is listed in the fifth column. In this instance, the mean response for 1.2.1 is 3.2. (FYI: The mean response for the entire study is 3.54). Please notice that although the listing order of the objectives in this example remains the same as in Round One, all objectives are now presented in an order commensurate with the mean level of importance figures derived from the Likert scales.

Your task for this round:

1) **Validate the priority order of the objectives in relation to their importance.** For example, in the component illustrated below, is 1.2.1 the most important, followed by 1.2.2, 1.2.3, and the new objective? If you believe the order is acceptable, just leave it as is. If you believe the order of importance is not acceptable, please revise order (use arrows if necessary) and state reasons. Please do this for each category on all five pages.
2) **Rate the new objectives added to the framework**. A few new items have been added based upon comments from Round One. Please circle the appropriate number on the Likert scale that reflects your belief of its importance and then place within the heirarchy of objectives for that category. Please note that the entire category, "Faculty Development/Resources" (4.4), is new.
3) **Pick the three (3) most important objectives on each page**. For example, with respect to Financial Aid on the next page, identify what you consider to be the three most critical objectives from the 17 that are illustrated within the four categories. Write the three objective numbers (in order of importance) in the area provided in the lower right hand corner of each page.
4) **Provide any additional comments you wish to add.**

Ladies and Gentlemen, I thank you for your quick responses and your considerable effort in this study. As soon as final analysis has been completed, I will send you a copy of my results. Thank you again for your assistance.

Best Regards and gratitude,


Mean Response Value
Scale of Importance: 1=Not Important 4=Important
Category Title
Frequency distribution from Round One Responses
Objectives in heirarchical order based on mean (AVG) response value from Round One
This area represents a new objective as suggested in the responses. It is important that you circle the appropriate level of importance and place within the heirarchy. (NR = No Rating).
1 2 3 4 AVG
1.2 Loans
2 0 4 6 3.2
1.2.1 Inform students & family members of availability and responsibilities related to Loans.
2 1 3 6 3.1
1.2.2 Streamline bureaucracy & forms to simplify the application process.
5 0 3 2 2.2
1.2.3 Frontload loan payments to provide more support in the early years of college.
1 2 3 4 NR
NEW: Provide emergency loans to students in need

1	2	3	4	WG	**1.1 Grants & Scholarships**
0	1	1	11	[illegible]	1.1.2 Identify and Inform students & family members of the availability of grants and scholarships and the appropriate steps that must be taken to apply for funding.
0	1	2	10	[illegible]	1.1.1 Maximize availability of Grants and Scholarships compared with Student Loans.
3	0	4	4	2.8	1.1.3 Frontload grants and scholarships to provide more support in the early years of college.

1	2	3	4	WG	**1.4 Financial Counseling**
0	0	1	10	3.9	1.4.1 Inform students and families of all available options related to the financing of college.
1	2	2	7	3.3	1.4.4 Train financial counselors to be sensitive to issues related to race and ethnicity.
0	5	3	4	2.9	1.4.2 Provide money management training to students and families.
1	5	3	1	2.4	1.4.3 Monitor student money usage during college.

Financial Aid

1	2	3	4	WG	**1.3 Assistantships/Work Studies**
0	0	1	12	3.9	1.3.1 Increase availability of assistantships and work study programs for undergraduate and graduate students.
0	1	0	12	3.8	1.3.2 Increase faculty participation with regard to student assistantships.
0	1	1	10	3.8	1.3.5 Keep assistantships and work studies under 25 hours per week for full-time students.
0	3	5	4	3.1	1.3.4 Develop partnerships with local area business to forge work and research opportunities for students.
1	4	3	4	2.6	1.3.3 Attempt to design assistantships and work study programs on or close to campus.
1	2	3	4	NR	***NEW: Create Assistantships with towns, metropolitan areas, or businesses that provide a mechanism for work after graduation at loan forgiveness.***

Please Circle

1	2	3	4	WG	**1.2 Loans**
2	0	4	6	3.2	1.2.1 Inform students & family members of availability and responsibilities related to Loans.
2	1	3	6	3.1	1.2.2 Streamline bureaucracy & forms to simplify the application process.
5	0	3	2	2.2	1.2.3 Frontload loan payments to provide more support in the early years of college.
1	2	3	4	NR	***NEW: Provide emergency loans to students in need***

Please Circle

Top Three Objectives:

1. ____________________

2. ____________________

3. ____________________

Recruitment & Admissions

1	2	3	4	WC	2.1 Student Identification
0	0	2	10	3.8	2.1.1 Work with pre-college programs to identify potential recruits.
0	0	2	10	3.8	2.1.3 Monitor the participation of students enrolled in pre-college programs.
0	1	4	7	3.5	2.1.2 Attempt to match student academic and career goals with the institutional mission of the campus.
2	2	2	4	2.8	2.1.4 Develop and focus outreach programs on the prime-targeted population of the university.
1	2	3	4	NR	***NEW: Further coordinate recruitment with the Alumni association to identify future students***
1	2	3	4	NR	***NEW: Use work study and teacher prep students to make visitations to middle and high schools to recruit students, and inform students about the need for study skills, good academic preparation, and advantage of taking AP courses.***

Please Circle

1	2	3	4	WC	2.2 Admissions
1	1	2	8	3.4	2.2.1 Incorporate portfolios, interviews, and other non-cognitive assessments.
1	1	4	7	3.3	2.2.2 Reduce the weight of SAT, ACT, and other tests.

1	2	3	4	WC	2.3 Orientation
0	0	3	10	3.8	2.3.2 Provide opportunities for pre-college students to live on campus.
0	1	2	10	3.7	2.3.1 Provide early orientation activities for families.
0	1	2	10	3.7	2.3.4 Involve all campus departments in the orientation process.
0	1	3	7	[illegible]	2.3.3 Provide satellite orientations for non-local students.
0	1	5	6	3.4	2.3.5 Ensure personal communications with students and families via phone and visitations.
1	2	3	4	NR	***NEW: Create freshman orientations that are required and for credit.***

Please Circle

Top Three Objectives:

1. ____________________

2. ____________________

3. ____________________

400

Academic Services

1	2	3	4	WC	3.1 Academic Advising
0	0	2	11	[illegible]	3.1.1 Provide academic advising and counseling for students on regular basis.
0	1	1	10	[illegible]	3.1.3 Use faculty for the academic advising students when possible.
0	0	2	11	[illegible]	3.1.4 Provide appropriate training in academic advising for faculty.
2	2	1	7	[illegible]	3.1.2 Keep log of student/faculty-staff interactions in a computerized monitoring system.

1	2	3	4	WC	3.2 Supplementary Instruction
0	0	1	9	[illegible]	3.2.1 Incorporate a variety of instructional methods to support student learning.
0	0	1	12	[illegible]	3.2.4 Encourage the use of peer study groups to foster learning and incorporate more labs with classwork.
0	1	1	10	[illegible]	3.2.3 Utilize peers as instructional personnel for supplementary instruction when possible to assist students.
0	0	3	8	[illegible]	3.2.2 Offer supplementary courses that focus on academic support skills (e.g., study skills, note taking, listening, writing, reading, time management) and academic content (e.g., biology, calculus, etc.).
1	1	3	5	[illegible]	3.2.5 Monitor all supplementary instruction activities by students and log into the computerized database.

1	2	3	4	WC	3.3 Tutoring/Mentoring
0	0	1	11	[illegible]	3.3.1 Provide regularly scheduled and easy access tutoring for students with regard to course work.
0	0	3	10	[illegible]	3.3.2 Use Research Assistants (RA), Teaching Assistants (TA), and exemplary undergraduates as tutors.
0	0	3	10	[illegible]	3.3.4 Encourage faculty to support the academic ***and social*** needs of students outside of class time .
0	0	4	8	[illegible]	3.3.3 Encourage peer tutoring and group studying within class population.
0	2	3	8	[illegible]	3.3.5 Identify and encourage the identification and use of minority students, faculty, and staff as mentors for students.
1	2	3	4		***NEW: Create reward structure for faculty involvement as mentors***

Please Circle →

1	2	3	4	WC	3.4 Research Opportunities
0	0	2	11	[illegible]	3.4.1 Support faculty to work with students on research projects.
0	1	2	9	[illegible]	3.4.2 Integrate regular research activities into curricula.
0	1	4	8	[illegible]	3.4.3 Develop industry partners for research opportunities.
1	0	6	6	[illegible]	3.4.4 Encourage business and industry to participate on campus through in-class demonstrations and experiments.

1	2	3	4	WC	3.5 Pre-College Programs
0	0	4	8	[illegible]	3.5.1 Develop pre-college programs at the elementary and secondary education levels.
0	0	5	7	[illegible]	3.5.3 Monitor student progress in pre-college programs.
0	1	4	8	[illegible]	3.5.2 Offer pre-college programs on and off-campus.

1	2	3	4	WC	3.6 Bridging Programs
0	0	1	11	[illegible]	3.6.1 Provide summer academic and social support for admitted students before the commencement of the freshman year.
0	0	1	12	[illegible]	3.6.2 Provide on-campus residency for students during briding programs.
1	0	3	8	[illegible]	3.6.3 Monitor all student progress in bridging programs.

Top Three Objectives:

1. ______________________________

2. ______________________________

3. ______________________________

Curriculum & Instruction

1	*2*	*3*	*4*	W.G.	**4.1 Curriculum Review & Revision**
0	0	1	12	3.9	4.1.1 Develop an ongoing review process of curricula utilizing faculty input and outside consultation.
0	1	4	7	3.5	4.1.2 Design curricula with interdisciplinary and real-world emphasis to stimulate interest and deeper understanding on behalf of the students.
0	1	5	6	3.4	4.1.3 Design curricula with knowledge of computer-aided instructional techniques and other technological innovations for instruction.

1	*2*	*3*	*4*	W.G.	**4.2 Instructional Strategies**
0	0	2	9		4.2.4 Provide appropriate instructional training for teaching faculty. **(MOVED TO 4.4--NEW CATEGORY)**
0	0	4	9	3.7	4.2.1 Incorporate interactive, relevant, hands-on, exploratory instructional practices, utilizing individual and small/large group strategies to maximize learning and motivate students.
1	0	4	7	3.4	4.2.2 Provide homework, out-of-class assignments, and in-class assignments for students.
0	0	7	5	3.4	4.2.3 Utilize educational technologies to complement instruction.

1	*2*	*3*	*4*	W.G.	**4.3 Assessment Strategies**
0	0	3	9	3.8	4.3.1 Conduct extensive student testing and assessment on a regular basis to monitor student progress.
0	0	2	10	3.8	4.3.2 Develop assessment instruments that ask students to synthesize and transpose information to new situations.
0	0	4	8	3.7	4.3.3 Utilize a variety of assessment techniques to encourage a diverse assessment strategy that allows for differences in student preferences. (e.g., paper-pencil, observation, homework, lab work, portfolio development, etc.).
2	0	5	6	3.2	4.3.4 Develop computer monitoring capability for instant trend analysis for student growth and development in terms of student assessment.

Please Note: NEW Category!

Please Circle →

1	*2*	*3*	*4*	W.G.	**4.4 Faculty Development/Resources**
0	0	2	9	3.8	4.2.4 Provide appropriate instructional training for teaching faculty. (Formerly from 4.2)
1	*2*	*3*	*4*	NR	***NEW: Develop a center for teaching excellence to support teacher development.***
1	*2*	*3*	*4*	NR	***NEW: Make available and identify grant opportunities for classroom research.***
1	*2*	*3*	*4*	NR	***NEW: Develop an appropriate faculty reward system***

Top Three Objectives:

1. ____________________

2. ____________________

3. ____________________

Student Services

1	2	3	4	WC	**5.1 Campus Climate**
0	0	1	12	[illegible]	5.1.5 Provide and support a pluralistic environment for students by promoting diversity and multiculturalism through special programs, activities, and curricula.
0	0	2	11	[illegible]	5.1.1 Provide a safe campus environment for all students, faculty, staff, and visitors.
0	0	3	9	[illegible]	5.1.2 Provide social opportunities for students through entertainment, sports, extracurricular activities, special events, and academic-related social events.
0	1	0	11	[illegible]	5.1.3 Provide non-classroom opportunities for faculty-student interaction.
0	2	4	6	[illegible]	5.1.4 Support the organization of student clubs, associations, and fraternal organizations on campus.

1	2	3	4	WC	**5.2 Accessibility/Transportation**
0	0	2	10	[illegible]	5.2.2 Offer classes in a variety of timeslots to permit flexible scheduling by students.
0	0	4	8	[illegible]	5.2.1 Ensure transportation link with local area metro system for increased access to campus.
0	1	3	8	[illegible]	5.2.3 Offer classes in concurrent semesters to allow for student flexibility in scheduling.
0	2	2	8	[illegible]	5.2.3 Offer classes on weekends and special Friday-Saturday combinations.
0	2	5	5	[illegible]	5.2.4 Utilize distance learning technologies to allow for a broader audience and support those students who cannot attend on -campus classes.

1	2	3	4	WC	**5.3 Housing**
0	0	4	9	[illegible]	5.3.3 Ensure affordability of housing and meal plans.
0	1	3	9	[illegible]	5.3.1 Encourage on-campus housing for students.
0	1	5	7	[illegible]	5.3.2 Provide an appropriate number of housing slots to meet the needs of the student body.
2	0	5	5	[illegible]	5.3.4 Develop housing patterns that may incorporate choice of major or other demographic issues.

1	2	3	4	WC	**5.4 Counseling**
0	0	3	10	[illegible]	5.4.1 Provide psychological and social counseling to students to support added stresses in society.
0	0	3	10	[illegible]	5.4.4 Provide career counseling to ensure that students, in accordance with academic advising, are following the proper path to reach their goal.
0	0	3	10	[illegible]	5.4.5 Provide counseling services that are cognizant of the cultural and racial issues facing students.
1	1	3	8	[illegible]	5.4.3 Develop and disseminate appropriate publications, brochures, and mailings that inform students of issues and programs.
1	1	3	7	[illegible]	5.4.2 Offer a variety of counseling opportunities and techniques, including individual, group, computer, video counseling sessions.

Top Three Objectives:

1. ______________________________

2. ______________________________

3. ______________________________